The Builder.

No. CLVI.

SATURDAY, JANUARY 31, 1846.

FULHAM, called in ancient writings Fulanham and Foulham, has been distinguished as the residence of the Bishops of London from the 7th century. Faulkner, in his "Historical Account of Fulham," which contains all the information on the subject that can be found, says the earliest mention of the place occurs in a grant of the manor to Bishop Erkenwald, in 691.

The rectory is in the patronage of the Bishop of London, and is now held by the Rev. R. G. Baker, who succeeded the Rev. William Wood, the last in the list of rectors given by Faulkner. The first rector recorded by Newcourt, John de Sancto Claro, was presented to it between 1304 and 1313; Henry Martin was vicar in 1329.

The parish church, dedicated to All Saints, is an ancient structure, and stands near the bank of the Thames, at the foot of Putney Bridge. Notwithstanding its early connection with the Bishop's Palace, and consequent notoriety, nothing is known of its foundation. "We were in hopes," says Bowack, in his 'Antiquities of Middlesex,' written in 1705, "whatever imperfect accounts have been left of the foundation of other churches, that here we should not have wanted light, since it is situated so near the Bishop of London's seat, which appears to be much ancienter; but after the most inquisitive search, we could discover nothing at all;" nor have succeeding inquirers been more successful. It consists of a nave, two aisles, and chancel, and has a massive square tower at the west end. It probably belongs to the 14th century, notwithstanding that the upper windows of the tower have rather a later character.

The writer last quoted says:—"We find in the Register Book of this parish, that Dr. Edwards, the Bishop of London's chancellor, a great benefactor to this church, gave by will, dated Jan. 9, 1618, 80*l.* towards its repairs, which was laid out in making a gallery, in new casting the lead of the steeple, and cieling the church; he likewise gave 16*l.* long before his death for building a new vestry, school-house, and lodgings for the master, clerk, and sexton, which, with other moneys raised in the parish for that purpose, were applied to the said use, which building was erected at the north door, joining to the church, about the year 1630. There happened no other general repair till the year 1686, when, by the industry of Mr. Robert Limpany, then churchwarden, the church was new roofed, beautified, enlightened, and the inside made more commodious, at about 160*l.* charge to the parish." In 1798 the structure was generally repaired, and its appearance further destroyed by miscalled 'beautifications.'

In 1839 a committee was appointed to inquire into the best means of improving the church accommodation for the inhabitants of Fulham, and directed their attention to two measures having that end in view, namely, the enlargement of the parish church, and the erection of a new chapel. They inclined, however, to the former, and directed Mr. Lapidge to submit plans for effecting it.

These plans being approved of, a contract for the works was entered into February, 1840, and was completed before the 18th of October, in the same year, when the church was opened for service. The alterations effected included an addition to the area of the building at the eastern end of the north aisle; the removal into the tower of a number of monuments and tablets by which the south-eastern extremity of the church was chiefly occupied; a re-arrangement of the galleries, the vestry, the pulpit, and the font. By these means 261 additional sittings were obtained (the number originally was 963), and in consequence of a grant from the Society for Promoting the Enlargement and Building of Churches, 172 of them are free. The total amount expended, after deducting the drawback on the duties on materials used (131*l.* 4s. 6d.), was 1906*l.* 5s.—of which, to the great credit of the parishioners be it said, above 1,600*l.* were raised by subscription.*

If we enter the church we shall find the nave divided from the aisles by clustered columns, terminated anomalously enough, by a horizontal entablature of wood and plaster, from which, on either side, springs an arched plaster ceiling, meeting in a point at the centre. The font, a specimen of the Gothic of 1622, stands in the middle of the church at the east end.

At the east end of the chancel, which is small—only eight feet in depth—there is a four-light window of perpendicular character, filled with painted glass, executed by Mr. Wailes. It presents figures of the four evangelists, one in each light, with four passages in the life of Christ. The traceried head contains the crucifixion, the ascension, and symbols of the four evangelists. An excess of yellow in the glass, which extends to the faces and hands of the figures, is injurious to the general effect. This window was presented to the church by the bishop.

The wall under the window is lined with panelling, carved in oak; and there are two carved canopies, one on either side, over the "commandments."†

Against the south wall of the chancel is a large monument to Lady Margaret Legh, who died July 3rd, 1603, represented in Faulkner's book, and over it is a marble tablet in memory of the Right Hon. Lady Sophia Margaret, wife of Sir Charles Eggleton Kent, who died Nov. 16th, 1834, and of Sir Charles, who died on the 5th of the following month. It bears these lines:—

When Heaven recalled the spirit pure and kind,
Whose sweet affection solaced life's decay,
The manly breast, that ne'er till then repined,
In grief's lone dwelling found it hard to stay;
The tie was broken, but the widowed heart,
To mercy's throne was lifted not in vain;
Join Sacred ashes! never more to part,
For death unites the severed nuptial chain.

On the opposite wall is a large monument in memory of "Thomæ Smitho," Nov. 27th, 1609, and over it a tablet with medallion head, to William Townsend, Esq., June 30th, 1823.

There are a few mural monuments remaining in the church, including a large one, admirably executed in oak and marble, placed against the east end of the north wall, in memory of Elizabeth Limpany, Oct. 10th, 1694.

The greater number, however, of the old monuments are to be found, as already mentioned, in the lower part of the tower, which, in consequence, takes the aspect of a sepulchral chapel. The most important amongst them, is a monument to Lord Viscount Mordaunt, with a statue the size of life,—the work of Bushnell and Bird. It is hardly necessary to remark, that many of the Bishops of London are buried in the churchyard.

The tower, it should be said, was not repaired with the rest of the building in 1840, although in a state of great dilapidation. But in 1845, a committee of the parishioners* were appointed by vestry, to examine into the state of the tower and advise as to the repairs necessary, and were afterwards empowered to obtain the assistance of an architect to carry out their recommendations. Mr. G. Godwin was accordingly called in, and, under his direction, the restoration and repairs were made.

The condition of the tower, and the aspect it presented, were most deplorable. The whole face of the stone work was much disintegrated by the action of the weather, and the mortar washed out of the joints, especially where the water from the roof had been thrown against it by the gargoyles, to the depth of several inches. The great west window had disappeared altogether, and the opening was filled up with a wooden framework of barbarous design, partly glazed and partly boarded up. The windows on three sides, in the third story, were covered by huge wooden dials, two of them eight, and one ten feet square; the stone work of all the other windows, strings, &c., was in ruins, the former being kept together by wooden supports: added to which, there was a serious fracture in the tower on the north side, from the top down to the string of the first story. The battlements and upper part of the tower and turret were of brick, coped with paving stone (the work of the *beautifiers* in 1798), and the whole was surmounted by an enormous wooden "extinguisher" (about thirty feet high), with a flag-staff and weathercock at the apex.

The accompanying engraving (p. 54), represents the tower, as now restored, seen from the south-west.

The upper part of the tower was taken down and rebuilt with Kentish rag-stone (the material of which the remainder is composed), the turret raised, the battlements, windows, (including a new west window), the strings, water-tables—in fact, the whole of the squared or moulded work replaced with Caen-stone, the flat laid with lead, and the whole face of the tower repaired with rag-stone and pointed with stained mortar, so as to make the old and new work appear alike, and preserve the ancient character of the structure. The louvres and dials are of slate. The entrance doors are of oak, and as it was found desirable to have the means of ventilating the church at this end of it, a pair of iron gates are introduced against the doors, having the hinges elaborated to fill the opening, and prevent the entrance of dogs.

The west window is filled with stained glass and patent quarries, including the arms of the Archbishop of Canterbury, his lordship the present Bishop of London, the Rev. W. Wood, late rector, and the present excellent rector, the Rev. R. G. Baker: this glass was formerly in the east window of the church.

The heads with which the outside label over this window terminates, represent the Queen and the Bishop—the latter is a remarkably good likeness.

The works were executed very satisfactorily by Mr. Samuel Cundy, of Pimlico, and cost in the whole about 1,000*l.*; of which in round

* His lordship, the present bishop, gave 200*l.*; Mr. Palmer, 200*l.*; the Rev. Mr. Baker, 105*l.*; Mr. Daniel, 100*l.*; Mr. Powell, 50*l.*; Mr. R. Wood, 50*l.*, &c.

† Faulkner gives an engraving of a sedile which was formerly in the south wall of the chancel.

* Mr. John Gunter, Mr. Henry Fitch, Mr. George Bagley, Mr. W. Chasemore, and Mr. W. Maiyear.

numbers, 400*l.* were raised by a rate, and 600*l.* by subscription.

The tower contains a fine ring of ten bells, which were recast by Ruddle at the beginning of the last century. The inscription on one is, "Peace and good neighbourhood," and on another,

"I to the church the living call,
And to the grave I summon all."

The height of the tower is about 90 feet, the size at the bottom, exclusive of the buttresses, about 25 feet square. The walls are of great thickness. The proportions are exceedingly good.

The exterior of the body of the church, with the exception of the new part at the east end, presents a miserably unecclesiastical aspect, and is in a bad state of repair. It is to be hoped that a long time will not be suffered to elapse before the whole be restored in a fitting and substantial manner. His lordship, the bishop, who together with Mr. Baker and the committee, has evinced great interest in the progress of the works, has expressed his willingness, we understand, to aid in effecting this much called for alteration. The wooden porch and part of the south side of the building are seen in the engraving, and will give some idea of the general character, or rather *want* of character.

A correspondent addressed us some time ago on the present state of Fulham parish, and the necessity which exists for improving it. Much might be done if the inhabitants would look at the question broadly, and co-operate for their mutual interest. We hope soon to hear, that a committee is appointed to take the subject into earnest consideration.

## PROFESSOR COCKERELL'S LECTURES ON ARCHITECTURE.

The third lecture of this course was delivered on Thursday, the 22nd inst., at the Royal Academy. Mr. Cockerell stated, that he should now continue his observations on the commentators of Vitruvius,—shewing further, that the Gothic architects adhered strictly to what they considered the rules of that author; also, on the results attainable in Gothic architecture, the originality of its treatment, and the importance of like originality in this day; the Vitruvian theory derived from the human form, the middle-age version of that theory, and the use of the peculiar form called the Vesica Piscis—the origin of which he considered was greatly misunderstood.—The manuscript books of Vitruvius had been preserved, but the plates which had accompanied them were lost. The medieval architects, therefore, had nothing to guide them but the text of the author; and their own interpretation of its meaning led to as grand and beautiful conceptions, as ever the classical architects had attained. This style was the expression of the wants and feelings of the time, and when the necessities of the age had no longer an influence, classical architecture revived; now by a change, doubtless as much required, the style of middle-age architecture was supplanting the classical. The various styles of Gothic architecture being expressive of the condition at each epoch, whoever undertook the pursuit of this branch of art, must be well versed in general history. Clio must be the especial Muse of such a student. The monkish chronicle was lost or perished; but the stone became an enduring record. Victor Hugo had said, and there was much propriety in the opinion, that as the fruits of the invention of printing ripened, sculpture and painting, which had previously been necessary for the fulfilment of man's most ardent desires, were superseded. For medieval architecture was the hieroglyphic writing of the past. And therefore, that the system of imitation, indulged in by the slavish copyists, who so abounded in these times, was discreditable. The mode of expression, formerly adopted in architecture, was as unfitted to the circumstances of our day, as would be the English of William of Malmesbury for a leading article in *The Times* newspaper. Remarking on the great prevalence of Gothic architecture at present, and the ardour in investigations, which had absorbed the whole of Europe, he said, that it was necessary for these lectures to subscribe to the spirit of the times; and that, therefore, he had determined this year to devote them to the present subject. He referred to his previous lecture,* saying, that the proofs he had then offered, as to the influence of the doctrines of Vitruvius upon the medieval architects, he considered to be ample; and that Vitruvius was in the highest esteem with the architects of that day. He had, also, given the explanation of some of the terms according to the middle-age version.—The professor then referred to a diagram from the work of Cæsarianus, and gave that author's explanation of the Vitruvian theory of the figure. Amongst others, which we are not able to illustrate here, there was a perpendicular line or axis bisecting the figure down the middle, and at the feet a horizontal line. For the purpose of erecting the latter line, as a perpendicular to the other, two arcs were struck from centres, according to the ordinary geometrical method. Thus, the figure which these arcs inclosed was bisected by a long and short axis. He then explained the system of the middle ages, and the proportion by aliquot parts, according to the principles of the human form, saying that the Gothic architects were better acquainted with the fundamental law of proportion of parts than the classical architects themselves. According to Cæsarianus, Vitruvius intended his theory of the figure to apply to the plan, as well as to the elevation;—and in a passage which the professor quoted, the author argued that it was just as important, that the plan should be regulated by the rules of symmetry, as any other part of the building, and instanced "Michael Angelo, the Florentine," as one who observed rules in this respect.

Mr. Cockerell then shewed, that the two arcs, before referred to, were in fact the mystical figure, called the *Vesica Piscis*, so much in use during the middle ages. He shewed its application, as surrounding a figure of the Trinity. He next directed attention to the long and short axis, and said, that the Vesica Piscis was adopted at the first, solely for the geometrical purpose of erecting a perpendicular upon a given straight line. All ideas, referring its origin to its connection with the fish, and the word ΙΧΘΥΣ, he considered to be erroneous. The Cambridge Camden Society had overlooked what he now suggested, and had only endeavoured to shew the connection between the fish, the emblem of Christ, and the monogram I H S, as originating from the Greek word for "fish," the letters of which they explained to mean Ιησοῦς Χριστὸς Θεοῦ Υἱὸς, Σωτὴς; or, Jesus Christ, the Son of God, the Saviour. They had seen nothing of the practical purpose, which was evident to architects, but were always for shewing their knowledge of Greek. He then referred to the supposed application of the plan to the body of the Saviour, and said that so deeply had this supposition been implanted in Germany, that the early reformers even would never attack the eastern part of a town, because the east end was supposed to represent the head of the Saviour. In referring to the investigations of Mr. Kerrich, into the use of the Vesica Piscis ("Archæologia," vol. xix.—37), he allowed that great credit was due to that individual, but said that he had, in claiming the application as "a sort of discovery," usurped that to which he had no right, as it had been explained by Cæsarianus. He shewed, that the plan of Milan Cathedral was inclosed in the figure of the Vesica Piscis, and itself inclosed two equilateral triangles, and fourteen equal squares one way, and eight the other. He also shewed, that it was the general rule to inclose the plan in the Vesica Piscis, and that St. Paul's Cathedral, the north and south porch being included, was amongst the number.

As to the meaning of that part of Cæsarianus's diagram, in which he represents the equal squares, Mr. Cockerell had long felt in difficulty, and had only lately been enlightened upon it through the aid of William of Wykeham. Mr. Sidney Hawkins, who, in his volume on the "Origin of Gothic architecture," had given a long account of his acquisition of a copy of "Cæsarianus," had entirely misrepresented the diagram, and had said nothing to explain it. There was, indeed, great difficulty in understanding it; but he now felt satisfied as to its meaning. He then proceeded to explain the other element in the proportioning of a plan, which, in the words of Mr. Kerrich, he might venture to call "a sort of discovery" of his own. As was said by an old author, he had no doubt, that many would say, when they heard it, that they had known it long before; but he was not aware of any such explanation. The system was shewn by the professor from plans of several Gothic buildings, in all of which it was clearly observable, and in most of the cathedrals, the names, amongst others, including Westminster, Lichfield, and York. It may be thus explained. For example:—in what was called the *tetra-style* arrangement, or that having four buttresses in the west front, the whole area was divided into equal squares, and the piers were placed at certain of the intersections. The system where the arrangement was dipteral, or with six buttresses in the west front, and four rows of columns, was merely an extension of the same principle. The reader will better understand the description by following it with the pencil. Let a horizontal line be drawn first, and then bisected by a perpendicular. Then set off, on each side of each line, a succession of equidistant parallel lines; these will of course form equal squares. Consider the first perpendicular line as the longitudinal axis of the building, the first line on each side as the line of the columns, and the second line as the wall of the building. Continue by the same method, to obtain the length of the transepts and position of their columns. Taking then the extreme length of the transepts as a radius, with the centres on the intersections at the horizontal line, describe two equal arcs, that is to say, the figure of the Vesica Piscis. The points of the figure will be upon the longitudinal axis, and will give the east and west ends of the building. The short axis gives the west wall of the transepts, and formed the base to two equilateral triangles, inclosed in the figure, as shewn in the professor's plan. He referred to Romsey Church as an instance of perfect accordance with the system, so much so, that a pier at the east end was placed on the axis of the figure; and he had no doubt that a similar feature had existed in the west end, as originally built. It was probably not departed from during the early schools; and the plans exhibited shewed that it was observed in the latest. This system of aliquot parts was by no means so completely carried out in the Grecian and Roman styles, as in that of the middle ages. Even in the basilica, from which the plan of the Christian Church was supposed to have originated, we found a defect in this particular. In illustration, he referred to the plan of the basilica of Trajan, in which, as in that of St. Paul, the rows of columns were further apart in the transverse, than the distance between the columns in the longitudinal section. Therefore, this system of proportioning by equal squares was a high merit in the style of the middle ages, to which time the honour of the invention was undoubtedly due.

He then referred to the four squares, giving the position of the central tower, called by Cæsariano—"octagon hecuba tholata pyramidata," about which he should have to offer further remarks. He also exhibited plans of the church of S. Zaccaria, and that of SSmo. Salvatore, at Venice, which though in the style of the early revival, preserved the system of Gothic architecture in the plan, in which, also, a pleasing variation was made by coupling, or omitting, the arrangement at alternate intersections.

In reference to a system of proportion in the section of a building, Mr. Cockerell explained, that the Gothic architects adopted a mode, in which equilateral triangles were employed. This he shewed from a section of Milan cathedral, which was given in Cæsariano's work. He also shewed, that the same rule of proportioning the height to the width, that is to say, making the height to the crown of the centre vaulting equal to the perpendicular height of an equilateral triangle, whose sides were each four squares, where the arrangement was "tetrastyle," and six squares, where it was "dipteral," and "hexastyle" was the universal

* Reported in the last number of The Builder, p. 36.

*system*. The plans of all our cathedrals were tetrastyle, and he mentioned the majority of them by name, as having their height exactly corresponding with this dimension. The same rule was found to exist at Bologna; and lastly, and the professor appeared to have some pleasure in drawing attention to the circumstance, in our own cathedral of St. Paul. He then said, that the only exception to this rule, which he was aware of, was Westminster Abbey. In that building, the actual height made the length of each side of the triangle greater than the four squares, by a dimension equal to two squares additional; thus it agreed not with its tetrastyle arrangement, but with the dipteral and hexastyle, the equilateral triangle, including the cloister on the south side, and an equal space of ground outside the building on the north.* * *

## AWARDS OF OFFICIAL REFEREES.

### BACK YARDS AND AREAS.

Messrs. Haward and Nixon desired to erect a water-closet over part of the yard at the back of a house in Suffolk-street, Pall Mall, and another above it on the one pair floor, or third story, to which the district surveyor objected, on the ground that "the erection of the said water-closets would reduce the size of the said yard or area to less than three-quarters of a square, such being the smallest size, exclusive of any building thereon, permitted by schedule K, of the said Act, for back-yards or open spaces attached to dwelling-houses hereafter to be built."

He concurred in an application to the referees, requesting them to take into consideration, that the said house was an already built house, and that no part thereof was to be rebuilt, and that the water-closets could not be conveniently built elsewhere; and also, that little or no sacrifice of light and air would be occasioned to the said house by reason of the said water-closets being built.

The referees determined "that it will be contrary to the said Act to occupy with Building any part of the existing back-yard or open space above the level of the floor of the third story" (or one pair) "of the house in question."

### STREETS AND ALLEYS.

Mr. Furby proposed to erect dwelling-houses on each side of a plot of ground in Bethnal-green, to be approached by a paved court not less than 20 feet in width, but equivalent to the height of the buildings, and having one entrance only, where he proposed placing iron railing and gates. The Act requires that every alley shall have two entrances; applicant was advised that, by reason of his inclosing the place in question, and his right to exclude the public from it, that it was not to be deemed a public place within the meaning of the said Act. The referees decided that, notwithstanding the intention to place gates, the proposed court would be an alley within the meaning of the Act.

### SHED BUILDINGS.

An open shed belonging to Messrs. Enderby, at East Greenwich, used as a rope-walk, was partially destroyed by fire in March, 1845. On reinstating the said buildings, objection having been made to the materials thereof by the surveyor of the district, the matter was referred to the said official referees, who determined "that if the shed in question be used as a rope-walk only, and be separated from any other building by one or more sufficient brick or stone walls, without any bond or other timbers therein next the said rope-walk, and without any more than one opening, or doorway in any such wall, and having no wood lintel, or other woodwork in or within one foot of the said openings or doorways, then such rope-walk will not be contrary to the provisions of the Metropolitan Buildings Act."

Since the date of the award, the repairs have been continued to the said building, and in execution thereof the flat or gutter on part of the shed has been formed of felt on deal boarding in continuation of the gutter on an existing part. And for the purposes of the trade of the said Messrs. Enderby, the shed has been extended in width; to which proceedings the district surveyor objected.

The referees awarded "that inasmuch as the works in question are proposed in continuation of an existing long range of shed buildings used for the purposes of a rope-walk only, and such buildings being also insulated except at one end, and being at that end severed from other buildings, and those other buildings in the same possession and occupation therewith, by brick walls having iron doors in them and by void spaces, we will forbear to make any award thereon, and that it is our opinion that the surveyor of the district will be justified in permitting the said works to be done, as described in the said requisition, and shewn in the (said) drawing."

A number of important questions in connection with the revision of the Act, the constitution of the office of metropolitan buildings, &c., have been urged upon us, and will receive early consideration.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

### THE WILHELMA—RAILWAY TERMINI.

A meeting was held on Monday evening last, Mr. Papworth, vice-president, in the chair. Among the presents received was a valuable collection of Parliamentary reports, on matters connected with architecture and building, from Mr. Kendall, and an account of the abbey church of St. Peter and St. Paul, Dorchester, recently published by the Oxford Architectural Society.

Mr. G. Bailey, the hon. secretary, read a letter addressed by Mr. David Roberts, R. A., to Mr. Britton, relative to the east wall of Roslyn chapel. The aisle at the east end is wider than the side aisles, and the vaulting is terminated against the wall by large corbels of singular design. Mr. Roberts contended that the east wall had been pulled down, and set further back, to give three feet more room.

Mr. Roberts afterwards addressed the meeting at some length, in defence of Sir Walter Scott, against a remark casually made by Mr. Britton at the last meeting, to the effect that, in ten lines of "The Lay of the Last Minstrel" referring to Roslyn, there were ten mistakes. The principal point was, whether or not the "ten barons" in their mail, were buried in the chapel.

The conversation becoming rather too extended on this point, Mr. Tite humorously terminated it by quoting two lines from one of the notes to the poem:—

> "The knights are dead; their swords are rust,
> Their spirit 's with the Lord,—*I* trust."

Professor Donaldson read an extract from a letter addressed to him by Herr Zanth, on the subject of the building lately erected by Herr Zanth for the king of Wirtemburg, and called the *Wilhelma*, from the name of the royal owner. This building, which has been spoken of as a conservatory in the moresque style, may rather be called a royal pavilion in the midst of four conservatories, accompanied by porticos, steps, terraces, and flower gardens. The pavilion is constructed of squared stone, in courses, of varied colour—white, yellow, and violet. The covering is of copper, partly gilt: the conservatories and porticos are of cast-iron, of Arabian character, extremely slender and richly ornamented. The conservatories are divided into two aisles containing rare flowers, and abut against two pavilions surmounted by glazed octagonal cupolas for tropical plants. The length of the whole is 323 French feet. At the end of the conservatories commence the porticos, which form the inclosure of a flower garden for the private use of the king. The pavilion of habitation, which is also for the use of the king alone, consists of a vestibule, an oriental court with a fountain, picture gallery, divan, sleeping and dressing-room, the grand saloon, *salle à manger*, and offices, also a bath with stalactitic vaults enriched with colour, gilding, and lights. Throughout the building the most brilliant colours, painted glass, and other enrichments are profusely employed.

The interior is just now completed, and the whole will be ready to deliver to the king in the spring. "It is hardly necessary to say," remarks M. Zanth, "that the work has demanded the most intense study, every detail, however small, requiring delineation. For the interior of the saloon alone there were 120 drawings. The labour has exceeded my physical powers, and accounts for the present bad state of my health."

The king, being determined to prevent premature public criticism, rigorously prohibits the admission of any person to the building. M. Zanth has been appointed the king's architect, and made *Chevalier de l'ordre royal de la Couronne de Wurttemberg*.

Mr. Fowler read a paper on the proposed lines of railway which affected the metropolis, about to be submitted to Parliament. He stated, that he was indebted to Mr. Austin, the engineer, honorary secretary to the Metropolitan Improvement Society, for the facts that he was about to lay before the meeting, who, with a laudable zeal in the cause of improvement, had been at considerable pains to prepare a plan of the whole of those lines for which the deposits had been completed. He need scarcely say, that there had been a whole host of other schemes, which, fortunately, had not survived the fatal effects of the late panic. Of those that remained, it appeared from the plan, that there were twenty-one different lines, comprising 100 miles of proposed railway, within a circle of 5 miles from St. Paul's. The spaces scheduled for termini, within a circle of 1½ miles of St. Paul's, together with that necessary for the construction of so much of the lines, constitute an area little short of 200 acres! To form a more vivid idea of the extent of this area, it may be stated, that it exceeds that portion of London extending from High-street, Whitechapel, to St. Paul's Cathedral, included between Leadenhall-street, Cornhill, the Poultry, and Cheapside, on the north, and the river Thames on the south. It constitutes an area equal to one-third of the city of London, and little less than one-half of that devastated by the conflagration of 1666. On a moderate calculation, it would involve the destruction of between 9,000 and 10,000 houses, and cause an expenditure, for the purchase of property alone, of about 15 millions sterling!!!

Mr. Fowler stated, that a memorial on the subject had been forwarded to Lord Lincoln, first Commissioner of Woods and Forests, by the Metropolitan Improvement Society, praying that the Metropolitan Improvement Commission would take the subject into their earliest consideration; and it behoved, not only professional men, but all who desired to see a right direction given to this extraordinary movement, to second the prayer of the society, that this branch of the general subject of railway communication should be considered as a separate and distinct whole, in order that a comprehensive and systematic plan might result from what was now a heap of confusion, arising from the fact, that each line had been separately laid down by its respective company, without reference to, or knowledge of what was being proposed by the other.

## FOREIGN ARCHITECTURAL AND COLLATERAL INTELLIGENCE.

*The Ancient Monuments of Spalato and Salona in Dalmatia.*—On the present state of those splendid structures of the Diocletian age, of which Salona was called by the Greek writers (*Porphyrogenitus*) a little Constantinople—the following may be noticed:—As these palaces and temples have experienced, like most others, a subversion by many succeeding catastrophes, their complete elucidation cannot take place by mere study *above* ground—but has to be followed up to that depth, at which they are partly buried. Notwithstanding, however, the vast extent of the Palace of Diocletian at Spalato, and that gorgeous position of Salona, no plan has yet been traced of these splendid art-remains, and the so-called museum at Spalato does not contain but the most trivial rubbish. It was not but lately, that Government have prevented persons from using these ruins most shamefully. During the long reign of Venice, every Conte or Provetore used them as a quarry for his palaces in the metropolis, and columns and architraves were removed in that way. The French were not much better, and until the late appointment of a conservator, the Austrians committed the same Vandalism. In stepping into the area before the temple and the vestibule of Diocletian's palace in Spalato, the beholder is horrified by those large square holes,

* In report of second lecture, line 16 from conclusion, *for* "Roman" *read* "Norman."

which have been made into the arcades for building some new houses; and so late as September 1844, the architrave of the so-called *Ponta argentea* was demolished, for giving (as was asserted) more light to the passage underneath. If some small tenements contiguous to the ruins were to be demolished, and some changes made near the principal temple called *il Duomo*,—Spalato might become, what it really is, one of the finest and proudest monuments of Roman grandeur and art. [Extract from a letter addressed from Cattaro, by *Sir Gardner Wilkinson* to the German press. There is no English work extant on these mile-long ruins—although they lie only a few hours' steaming from Trieste, much visited by English art-travellers.]

*Large Purchases of Timber in the Spessard Forest.*— For replacing the great quantity of oak and other timber, burnt last year at Toulon, the value of which was estimated at more than one million of francs, French commissaries have arrived in Germany for making purchases. It is, however, difficult to conceive how such immense logs will have to be conveyed from the mountains to the sea coast.—*Allg. Zeit.*

*Another Incendiary Firing of a whole Town.*—It is most probable, that the great fire, which lately destroyed part of Luckenwalde, in Prussia, is the work of an incendiary. The fire originated in one of the manufactories on a Sunday, when no work is done. The loss of machinery, &c., is estimated at 150,000 dollars

*The Great German Iron Rail Manufactory Association.*—It proposes to furnish the rails required for the German lines, and is, therefore, established at Hilburgshausen, whence an easy conveyance to the whole periphery of the country may be obtained. The capital is to be 2,000,000 of dollars (350,000*l.*), divided into 10,000 shares, of 200 dollars each. The machinery to be first-rate: four large furnaces, capable of producing 8,000 cwt. of iron weekly, are in the progress of erection.—*Allg. Zeit.*

*Latest Increase of the Berlin Royal and Public Library.*—During the last year this huge establishment has received the following increase (1): 7,377 printed volumes, exclusive of pamphlets; (2) 145 MSS.; (3) 511 volumes of music; (4) 143 atlases, charts, plans, &c.—The room of periodical works (from which all politics are excluded) subscribed, last year, for 423 different journals, amongst which 60 of theology, 40 jurisprudence, 20 educational, 9 different journals of philology and archæology, 5 of the fine arts, 7 of mathematics, astronomy, and architecture, 34 technology and political economy, &c.—Dividing these into languages—there are 299 German, 55 French, 41 English, &c. [It needs hardly to be observed, that *no* public establishment exists in London, where periodicals on *every* branch of science, of the latest date, are to be found—and that, if even *all* the single establishments, colleges, &c., were to be put together, no such number as that of 423 periodicals could be met with.]

*Society for the Improvement of the Working Classes in Berlin.*—This society—or rather embryo of such, which had enjoyed a lingering existence of about twelve months, and to which the king had not only given pecuniary aid, but promised further, and every other possible assistance; which had been, moreover, recommended by the Prince of Prussia (as Great Master of the Prussian Lodges) to the best services of the royal craft—this society, we say it sorrowfully, has been dissolved after many fruitless projects, committee meetings, &c. It implies another *great* (melancholy) *fact*—that the condition of the working classes all over Europe, *required*, in the first instance, such endeavours; and after this necessity has been acknowledged, that there is (it seems so) a want of *practical* men, to carry these plans into execution!—*Berlin Paper.*

*Improvement of Public Thoroughfares, Paris.*—The common council of the city of Paris have decided in their last meeting, that it was expedient "to declare the public utility of an enlargement by the way of expropriation of the following thoroughfares."—from the Quai St. Paul to the line of the Quai des Ormes, and the prolonging of the Rue des Jardins until the Quai St. Paul.—The préfet of the Seine (Paris) has just addressed to the home secretary, for the information of his majesty's government, three extensive projects. 1. A plan to lay down the lines (*alignements*) of the *Rue de la Cerisaie* and the *Place de l'Arsenal.* 2. A plan to lay down the lines of the *Place des Marché-aux-Chevaux.* 3. A plan to lay down the lines of the *Rue des Grands Degrés*, and the *Quai des Tournelles.*

*Street Cleansing at Vienna and Munich.*—The new system of granite paving in the former metropolis has been adverted to in a previous number.* It is on such substantial substratum, that (with even an immense traffic) a substantial cleanliness of public thoroughfares can be achieved. Several characteristic expedients are resorted to at both the above capitals.—The cleansing is not done during the hours of *most* traffic, but those of least, viz. at sunrise; and in cases of emergency, such as a heavy fall of snow, hundreds of men are seen on the *Kohlmarkt* and *Graben* in this occupation, assisted by the light of numerous torches. In dry weather the footpaths are, of course, *not* swept, but *constantly* so after protracted rains, which makes them prepared, as it were, for the next wet, and never permits of that obstinate accumulation of mud, which makes the Strand, Holborn, &c., so very dirty after the least fall of rain. Both these expedients, however, would be of little avail, if that which has been just removed from *one* place, would be allowed to *remain* at another, and thus, undoubtedly, to *return* again to the former. There is no experimentalizing and trying in those German capitals, but a long-established routine—every thing emanating from one common centre, the municipality-offices for the cleansing of thoroughfares. What is also characteristic in this respect at Vienna, is that whenever, after long drought, dust is swept and removed, waterpots are at hand, by which the very unpleasant and unhealthy clouding of dust is avoided. The waste of all large towns in Germany is sold to the highest bidder, and largely contributes to the item of civic *budgets* relating to the cleansing of thoroughfares.—*Reiseskitzen.*

*Railway over the Lagunes of Venice.*—In the beginning of the year, an experimental trip was made over the magnificent bridge across the Lagunes, and three others thrown over the rivers Tessina, Bochigliere, and Retrone, and the two tunnels not far from Vicenza, one of which is 174 feet, the other 285 feet long. The whole distance between Venice and Vicenza has been accomplished in two hours, and the passage over the great bridge of the Lagunes in only eight minutes, while it takes more than an hour to accomplish the way along the bridge in a gondola. In the whole, the Venice-Vicenza line promises to be a sterling and durable building.—*Gazetta di Venezia.*

*Trieste and Bremen Line of Railroads.*—The Bavarian Government is making great preparations for constructing a railway from Munich to Salzburg—which, when achieved, would complete the junction of Trieste and Bremen, for which most parts are either constructed or nearly so. In the case of completion, the Adriatic and the German Ocean would be united (to an extent of 334 French leagues), in the way, that the journey could be accomplished in about forty-three hours. As Bremen lies only three hours way from Hamburg, the latter line through Holstein would lead the traveller to Kiel, on the shores of the Baltic.—*Journal des Débats.*

*Official Protests against Bad and Unsafe Railway Constructions in France.*—The Municipal Council of Havre, and the Chamber of Commerce, of the same city, have sent energetic protests against such a faulty and unsafe way of construction, as had been lately exhibited in the fall of the Barentin viaduct—addressed to the Secretary of State for Public Works. They state, that an accident of such extent augurs badly for the safety of similar buildings.—*Le National.*

*The Bridge Tolls of Paris.*—The disputes between the Three-Bridges Company and Government have ended in the discomfiture of the former, who wanted to increase the tolls for vehicles of a certain kind. The answer contains the declaration, that it is the duty of Government not to allow any too high straining of speculation detrimental to the great mass of the public.

*The "Fidget" after Knowledge.*—In no other age, it seems, has there been more talk about knowledge, *i.e. sterlingness*, and the less of it in reality. It is easy to talk of geniality, the march of intellect, advancement of art, the little patronage bestowed on it—but more difficult to *be* a superior artisan, or still more an artist, viz. one to be appreciated by even after-ages. There can be no doubt, that many persons *flounce* about these matters, who—if properly put to the test, would be found deficient in the very A B C of their different trades and callings. This we call the *fidget* after knowledge—such, as never will produce any sterling or great men; who, all of them, were perfectly *grounded* in the rudiments of their trade or profession *first*, and *then* took a majestic flight to higher regions—which, as a matter of course, none *unfledged* can ever accomplish. What strikes us, for instance, in the designs of *Palladio*, is the extreme ease with which they have been executed. The same were Michael Angelo, Raphael, and all the really *great* galaxy of all ages and in every branch of human endeavour; every stroke and dot in the drawings of the former exhibiting an instinct-like ease of, not so much doing, as *projecting* work. Columbus, moreover, was a very expert and nice draughtsman in his particular line; Jean Jacques Rousseau lived by copying music; Benjamin Franklin was a *wonderful* compositor—and even the ambition of young Cobbett was first directed towards excelling his brothers in "ploughing." To such *sterlingness*, young men must have arrived "*first*," before they have any right—or far less occasion for speaking and panting after science, knowledge, patronage, and geniality.—*Isis of Oken.* J. L——v.

* Vide Vol. III., p. 600.

## THE BRITTON TESTIMONIAL.

We stated some time ago that, at the suggestion of Mr. Britton, the amount subscribed was to be expended in obtaining (by competition) and printing, an essay on the study of archæological literature. This, however, being strongly objected to, was afterwards abandoned. In the course of a correspondence on the subject, Mr. Dawson Turner suggested, that instead of an archæological essay, it should be a full history of Mr. Britton's life, as exemplified by his works: in a letter to Mr. Britton, he remarked:—

"In such an essay you would speak of the events of your life; of your friends and patrons, now most of them dead; of the artists you employed; of the eminent persons you were brought in the way of, and of the difficulties, pleasures, and annoyances that attended, soothed, and embittered your career; and you would intersperse the narrative with a thousand anecdotes. You would thus make a charming book of materials that would otherwise perish with you, and would do invaluable good in your generation by the example you would hold out."

The committee concurring in this view, Mr. Britton undertook to devote his leisure to the preparation of such a work, and to expend the amount of the subscriptions in its printing and embellishment.

It will be accompanied by an engraved portrait of the author, by Mr. C. E. Wagstaff, from a beautiful picture expressly executed for the purpose, by Mr. John Wood, and a selection of the engravings which have illustrated Mr. Britton's works will be appended, in order to elucidate the general style of their embellishments. It will be printed in royal octavo; and a few copies in demy quarto will be prepared for the subscribers of 3*l.* and upwards. Copies in imperial quarto will be presented to distinguished individuals, and to the national libraries of England, France, Prussia, &c.

The Artists' Play.—The amateur performance in aid of the Artists' Benevolent Fund, already mentioned, took place on Tuesday last, and gave great pleasure to a large audience. Mr. F. W. Topham, Mr. John Wilson, jun., Mr. Holl (the engraver), Mr. George Cruikshank, Mr. Hamerton, and Mr. Matthew Wood, were among the performers.

Public Works in Ireland.—Sir T. Freemantle has obtained leave to bring in a Bill to amend the Act for the promotion of public works in Ireland, and proposes that a sum not exceeding 50,000*l.* be placed at the disposal of the Treasury for such purposes as circumstances might require.

## ARTISTICAL COMPETITIONS.

Sir,—Mr. Frank Howard's communication on the Art-Union cartoons, in your publication of Saturday week, is too remarkable a document not to have excited a marked sensation; it evinces more boldness than we expect from artists, and the candour with which you have inserted his opinions, so opposed to your own, is a fine manly feature in your journal, which will, I trust, cause its sale and influence to extend far and wide.

Mr. Howard's observations apply to two distinct objects, viz., to competitions in general, and to the opinion previously expressed in The Builder on one of the cartoons in the present exhibition. He appears on the whole pleased with the report of the Institute of the Fine Arts on competitions, printed in your journal of the 3rd inst., but he fancies he can suggest a different and a preferable mode of arriving at the intended results. Instead of improving tribunals, almost without exception incompetent or vicious, he suggests as a remedy, that a book be opened in the exhibition rooms, wherein "all the competitors should be required to record his opinions of any or all of the works except his own, together with his reasons, if possible, for such opinions, attaching his name and address. This should be done within a limited time, say the first fortnight, or he should forfeit his right of competition." There is also to be another book for amateurs to do the same if they choose. "Guided but not governed by these opinions the parties who give the money should decide for themselves." To accustom artists to critical examination is certainly very desirable; to encourage a manly declaration of sentiment in a proper tone, is the way to multiply fine feeling, so essential to elevated pursuits. In short, the practice thus recommended would, if carried out unexceptionably, induce artists to consider their subjects and the right mode of treating them; they and the public might consequently learn what really constitutes a good picture, and how to get rid of meretricious incapability; but experience will discover many shoals and fearful dangers at the mouth of this safe harbour, which would be avoided by the more expanded and wider passage pointed out in the report of the Institute of the Fine Arts.

The good which Mr. Howard expects to result from his plan, through the information communicated to artists, amateurs, and the judges, will of course depend on the quality of that information given under the penalty of losing a competitor's rights. Under such regulations, timid men will give as little as possible, whilst their own works will be exposed to the violent attacks, perhaps the insidious undermining or the envenomed shafts of desperate and crafty rivals. Amateurs, the friends of busy competitors, may add the weight of their side batteries in support of those attacks on the humble and defenceless. These will retire and never again appear on the field, whereon the reckless and the fearless will be left to tear each other to pieces. Such an exhibition would add nothing to the respect felt by the public for the profession or the arts; nor would conventional notions, affectation of anatomical knowledge, the usual artistic inefficiency in history or antiquities, enlighten the judges in the proper direction. If, on the contrary, artists can be persuaded to write candid, considerate observations, devoid of jealousy or personality, then indeed the effects, as far as they went, would be advantageous; but to judge from Mr. Howard's own specimen, purity in this respect is very hard to attain; the opinions he expresses are always merciless, and calculated to irritate a fiery opponent and to terrify a timid one, and drive him off the field. This would affect most artists who have a reputation to lose, and many who have to gain one. In practice, the plan is not so simple as he supposes. First, every artist who does not write in the book his opinions, is to lose his right of competition: this would be unjust to competitors out of London—at Manchester or Liverpool, Dublin, Edinburgh, &c. Again, with the very moderate number (28) in the present exhibition, twenty-eight times twenty-seven make up 756 critiques, and if only ten amateurs, urged by one or other candidate, should throw their weight into the scale, then the number becomes 1,036 paragraphs. Mr. Howard's own sample criticism of one of the cartoons amounts to fifty-eight lines; taking this as an average, the whole would be 60,000 lines, or 2,000 ordinary pages of book printing;—a pretty large quantity for the jaded-artists to pen, and the public to read, during the exhibition. Mr. H. will hardly deny that the representative plan suggested in the report of the Institute of the Fine Arts is rather more practical than his unripe proposal.

Really, Mr. Editor, the insertion of critiques and observations from both sides of the question in a periodical like yours, in the way you have so honourably done already, would seem to answer every rational purpose of Mr. Howard's proposition. If the artists choose to appoint committees or advocates of their cause, and their pleadings are printed, then may each judge in the competition, and every artist in the kingdom, quietly by his fire side read and reflect on that evidence, far better than *a few* could do in a public exhibition-room. How that gentleman's proposal can do away with the necessity of any part of the plans proposed by the Institute of the Fine Arts, in which the criticism is left to persons less excited, more impartial judges, I am at a loss to understand: it removes no vice in the appointment or management of our competitions; it leaves, partiality and prejudice unchecked; it does not fix and identify the responsibility, or provide for the equitable decision of courts; it gives indeed a voice, and *proferes nihil* to the artists; it removes no hardship, no unnecessary burthen; adds no comfort, no solace to the wounded feelings, no remedy to the pecuniary losses of the candidates. Still let artists derive one advantage from Mr. Howard's immatured attempt. Let them dare to express with force and with feeling, but with *moderation*, the effects of ill-advised measures for the promotion of art, and brighter days will shine on the exertions of native genius.

I remain, Sir, &c.,
An Old Competitor in Historical Art.

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*Art-Union Cartoons.*—Mr. F. Howard has addressed a letter to us, complaining of what he terms the "villanous perversion of the text of the *Athenæum*" by our correspondent of last week, "An Old Writer on Fine Art," and calls on us as an act of justice to insert an inclosed reply in our present number. We must, however, decline doing so, having satisfied ourselves that "An old Writer" has in no degree perverted Mr. Howard's meaning.

The following is the close of Mr. Howard's letter:—"You are welcome to inform the public that my cartoon is Anne Askew refusing to sign the six articles, which in the words of my motto, I claim to be "a work of mind."

"'Tis not in mortals to command success,
But we'll do more, Sempronius, we'll deserve it."

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## A NEW PAINT.

At the last meeting of the Society of Arts, on Jan. 21st, a paper was read by Mr. H. Page, "On the New Patent Oil Integument; or Skin of Paint," by which facility is afforded for interior or exterior decorations. The author, after pointing out the various inconveniences which the public experience in having the painting, graining, and oil decorations done on the premises, proceeded to shew some of the advantages which he obtains by substituting a prepared skin of paint for the ordinary common painting. These advantages are apparent in the decoration of ceilings, or in the execution of any kind of flat ornamental work, whether it be imitation of woods, marbles, lettering in gold or colours, on walls or woodwork, as it is only necessary that the dimensions of the parts to be ornamented should be previously taken, and the work can be completed at the artist's shop or study. The author next proceeded to describe the process of manufacture, remarking that the skins at present made are 12 feet by 3 feet, that being found the most convenient size, but they can be made of any dimensions. The mode of fixing the skin is to rub down the surface on which it is to be fixed, and, when thoroughly cleaned, it is gone over with boiled oil and gold size (a smear is sufficient), the skin is then laid on with a soft cloth, as in the ordinary paper-hanging. Several specimens were exhibited.

## ARCHITECT'S RESPONSIBILITIES.

Sir,—In reply to the letter of "An Architect," in your paper of the 17th of January, I have only to say, that I never justified an architect's "allowing" defective workmanship, nor of his permitting "such workmanship to remain."

I merely intended to intimate to the employer that, when no clerk of the works is engaged, and the visits of the architect can only be occasional, certain defects of workmanship (trifling in themselves, but annoying in their *temporary* results) may shew themselves, without impugning the architect's professional character. This, of course, presupposes that his drawings and specifications are in all respects complete.

As to your correspondent conceiving that I sought exemption from the duty of seeing that all defects be *remedied* before final payment, it only shews that I have not expressed myself clearly. I always reserve, for a certain period, at least one-fourth the value of the whole work, as a security against such defects; and, of course, feel it imperative on me to see them satisfactorily corrected before I give my closing certificate. The intention of the particular clause in my letter, to which your correspondent refers, as the only one requiring explanation, was to anticipate the unreasonableness of those employers who, declining a clerk of the works, refusing to pay the architect any thing for his travelling *time*, and even grudging his travelling *expenses*, have yet been astonished at finding that, during the early occupation of the new building, they have had to suffer the inconvenience of the contractor's re-entering to stop a leak, perfect a gutter, repair a ceiling, clear a drain, or cure a chimney! In short, my circular merely requires an additional paragraph at the end of the sentence beginning "Fourthly," &c; and another at the close of that, commencing with "4th. Superintendence," &c.

"Fourthly, you engage him to supply all such *working drawings* and *occasional* superintendence, as shall insure the accurate and substantial execution of the works, so far as regards their *architectural truth* and permanent *strength*, and to see that all defects of workmanship shall be remedied before the builder or contractor receives his final payment.

4th. *Superintendence.*—The architect is *not* employed as an operative builder or clerk of the works. It must be clearly understood, that his *occasional* visits and *working drawings*, can only have *reference* to architectural accuracy and the liberal fulfilment of the leading articles of the specification, as affecting construction *generally*. If the builder, his foreman, or operatives be careless, and a competent clerk of the works be not engaged, roofs may leak, plumbing may partially fail, plastering may crack or become discoloured, drains may yield offensive odours, joinery may shrink, chimneys may return their smoke (indeed the latter nuisance may occur in spite of all precaution), and many other evils may shew themselves, without, necessarily, impugning the character of the architect, or in the least affecting the general stability of the structure. The most trying annoyances may originate in the most trifling defects of workmanship, and nothing short of a vigilant clerk of the works, exclusively employed without intermission, can insure perfection in matters of constructive detail." [The architect does not, however, claim exemption from seeing that all *remedial* measures be effected. See "Fourthly," &c., 1st page.]

I should say, that my letter has never yet been issued, and, furthermore, that I have never yet made any charge for time occupied in travelling. I wish that I had benefited by your correspondent's correction before the publication of my letter, since I am now likely to suffer under an imputation which is solely referable to a want of explicitness.

I am, Sir, &c., Geo. Wightwick.

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Vacancies for Inspectors of Pavements.—The Commissioners of Sewers of the City of London will meet in the Guildhall on the 24th of February, for the purpose of electing two Inspectors of Pavements. Candidates must be between 25 and 35 years of age, and Freemen of London. The salary is fixed at 150*l.* per annum, and there are no gratuities or fees.

FULHAM CHURCH.

VIEW OF TOWER AS RESTORED.—MR. G. GODWIN, F.R.S., ARCHITECT.*

## AN IMPORTANT CASE IN BUILDING AND CONSTRUCTIVE CARPENTRY.

THE walls of a brick building of which the plan is 16 feet by 34 feet, are respectively 12 and 15 feet in height, the front wall being 3 feet higher than the back one, and the thickness of each 15 inches. The rafters which rest upon the back wall are 13 feet long, while those that rest upon the front wall are of such a length as to give both sides of the roof the same inclination or slope; the rafters are sixteen in number on each side, with a scantling of 6 inches by 2½ inches of Mar forest fir, the laths being of the same material. The roof is covered with plain tiles five-eighths of an inch in thickness, and overlapping one another half their length, thereby giving a double thickness to the covering, and making together with the laths and rafters, a weight of not less than 15 lbs. on a square foot of surface. The rafters are tied together by joists or tie-beams on a level with the summit of the higher wall, but in consequence of there being no other ties, the feet of the longer rafters have been allowed to slip outwards, and force the back wall from the perpendicular through a space of 3 inches; and in order to prevent a farther deviation from the upright position, it is proposed to shore up the building with timber struts of 12½ feet in length; *at what point of height in the wall must the struts be placed, so that they may offer the greatest possible resistance in a direction parallel to the horizon?*

Such are the particulars of the data as they have been received, and such is the question proposed to be resolved, and to this extent the solution is simple enough; but there are other circumstances of a more prolix and difficult character connected with it, to which we think proper to direct the reader's attention, as having reference to a case of very frequent occurrence in practice, but for which we are not aware that any general rule has been given to guide the mechanic in the proper adjustment of the system; we allude to the determination of the shorter rafter when the longer one is known, so that the slope or inclination of the roof may be the same on both sides, the angle made by the concourse of the rafters being then bisected by a plummet suspended from the ridge.

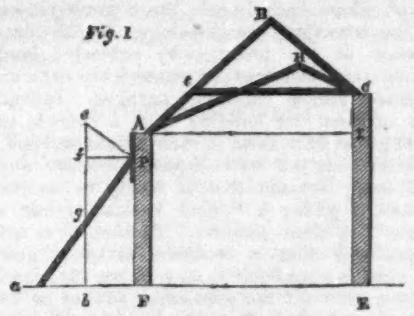
Let FE fig 1, represent the width of the building; AI equal FE the span of the roof;

* See p. 49 in present number.

FA, EC the heights of the back and front walls, and AB or AH the longer rafter which is given; then are BA, BC, or HA, HC, the positions of the rafters, the roof admitting of two pitches as we shall see anon; and since neither of them is given by the question, it becomes a matter of inquiry to determine the nature of the roof itself, and also the effect of its thrust upon the walls.

Let FABCE represent a vertical transverse section of the roof and walls, *a*P one of the struts, P the point in the wall at which it is applied, and *g* the position of its centre of gravity. At P, the upper extremity of the strut which presses on the wall, erect the perpendicular P*e*, to meet the vertical line *be*, passing through the centre of gravity in *e*, and let *f*P be perpendicular to *be*.

*Fig. 1*




The triangles P*a*F and *ge*P are similar, and by the principles of mechanics, the pressure of the strut *a*P in the direction *e*P, perpendicular to its surface, is as *e*P, and may, therefore, be represented by it; hence it follows, that the direct pressure is also as *f*P, and may consequently be represented thereby. Now, in estimating the force of the strut upon the wall in the direction of its length, we may assimilate that force to a weight applied at the centre of gravity, and acting in a direction perpendicular to the horizon; let *eg* denote this weight, then by the property of similar triangles, we have

$$aP : aF :: ge : eP = \frac{aF \times ge}{aP};$$

but the triangles P*a*F and P*ef* are also similar; hence it is

$$aP : PF :: eP : fP = \frac{PF \times eP}{aP}.$$

Now this is the force with which the strut *a*P resists the wall in the direction *f*P, and if the value of the force in the direction *e*P be substituted, we obtain

$$fP = \frac{aF \times PF \times ge}{\overline{aP}^2}.$$

The equation just obtained expresses the value of the force which resists the deflection of the wall in the direction *f*P, and the leverage by which it gains its power is PF; hence, the momentum or mechanical effect in resisting the wall, is

$$momentum = \frac{aF \times \overline{PF}^2 \times ge}{\overline{aP}^2}.$$

In this equation the unknown quantity is PF, and when that becomes known, the other quantities *a*F and *ge* are also known, but by the conditions of the question, the momentum or mechanical effect of the strut is to be a maximum; consequently, by equating the fluxion of the above expression with zero and transposing the terms, we get

$3\overline{FP}^2 = 2\overline{aP}^2$, and this by reduction, gives

$$FP = \tfrac{2}{3}aP\sqrt{6} = 0{\cdot}8165aP$$

Hence it appears, that if the length of the strut in any case be multiplied by the decimal 0·8165, it will give the height of the point in the wall, at which it is to be applied to produce the greatest effect.

In the present case, the length of the strut is 12½ feet; therefore, by multiplication, it is FP = 12·5 × 0·8165 = 10·21 feet nearly, and the distance from the bottom of the wall where the foot of the strut is placed, is F*a* = 7·22 feet nearly. But if the point in the height of the wall be previously fixed on, and the length of the strut not known, this length may readily be found in all cases, by making with the wall at the point of application an angle equal to 35° 16′; for by Plane Trigonometry we have

*a*P : radius :: FP : cos·*a*PF; that is,
12·5 : 1 :: 10·21 : 0·81650 = nat. cos. 35° 16′;

and this angle is constant in the case of maximum resistance, for every length of strut that does not reach above the summit of the wall.

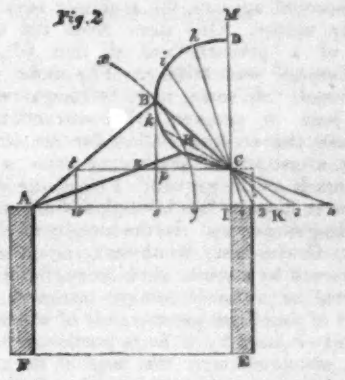
This is the method of resolving the problem, in so far as it respects the position of the strut, and in the next place, we have to determine the length of the shorter rafter, or the pitch of the roof, and from this to assign its effects in pushing out the wall from the perpendicular position.

In order to this, let AI, fig. 2, be the span of the roof; AF and CE the back and front walls, the one being higher than the other by a quantity equal to IC, and AB or AH the length of the longer rafter, which is supposed to be known. Produce IC directly upwards to M, and set off ID equal to AB or AH, the length of the given rafter; in AI produced beyond I, take any number of points whatever, such as at 1, 2, K, 3, 4, the more the better for an accurate construction. Then, through C, the point where the rafter meets the top of the higher wall, and the several assumed points, draw the straight lines 1*h*, 2*i*, KB, 3*k*, and 4H, and on these lines respectively set off the several distances equal to the given rafter AB, or vertical line ID; then are D, *h*, *i*, B, *k*, H, C, points in the curve described by the point D, while the lower end of DI is drawn along the horizontal line I 4, the line itself passing always through the point C. Through the several points just named let the curve D*hi*B*k*HC be traced, and we shall have a curve of the fourth order, in which the summit or ridge of the roof occurs. On the point A as a centre, with a radius equal to the length of the given rafter, describe the circular arc *x*BH*y*, intersecting the curve in the points B and H, and draw AB, AH, and CB, CH; then will ABC and AHC be the pitches of the roof required. If the circular arc *x*BH*y* does not intersect the curve, but merely touches it in a single point, the roof will only admit of one pitch, having its ridge in the point of contact; and if the circular arc does not touch the curve at all, the construction is impossible with the given length of rafter.

Such, therefore, is the method of delineation under the conditions specified, and if CB and CH be applied to the scale of construction, the length of the shorter rafter for both pitches will be approximately known, and this in most practical cases will be sufficient, and beyond this point mechanics in general will not attempt to go; but in order to render the solution of the problem more complete, we think proper to shew the mode of calculation also.

Through the point C, draw the straight line C*t* parallel to the horizon, and meeting AB in

*Fig. 2*




the point *t*, and AH in *x*, and from the points *t* and B let fall the perpendiculars *tw* and B*s*; then are the triangles A*tw*; AB*s*, and *t*B*p* similar among themselves. Therefore, by the property of similar triangles, we have

$$At : Aw :: Bt : tp = \frac{Aw \times Bt}{At};$$

$$\text{but } Iw = 2tp = \frac{2Aw \times Bt}{At},$$

and by addition, we get A*w* + I*w* = AI; that is

$$\overline{At}^4 - 52\overline{At}^3 + 411\overline{At}^2 + 468At = 6084.*$$

Here we have an equation of the fourth degree with all its terms present, consisting of three positive roots and one negative. In this equation, A*t* is the unknown quantity, and its two values will be expressed by two of the positive roots of the equation; which roots by approximation are found to be

A*t* = 4·4 feet, and A*z* = 9·1 feet very nearly.

By repeating the steps of the approximation the values of A*t* and A*z* may be found to a higher degree of accuracy; but it is unnecessary in the present instance, as the numbers found are sufficiently accurate for every practical purpose. Therefore, by subtracting each of these values from 13, the length of the given rafter, we get

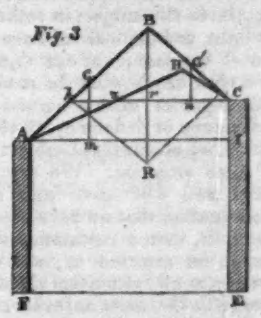
BC = B*t* = 13 − 4·4 = 8·6 feet;
and HC = H*z* = 13 − 9·1 = 3·9 feet;

so that for the higher pitch ABC, the rafters are 13 and 8·6 feet; and for the lower pitch AHC, they are 13 and 3·9 feet.

Having in the previous part of our solution determined the position of the strut, so that it shall present the greatest possible horizontal resistance to the inclination of the wall; and having, moreover, shewn the method of finding the length of the shorter rafter when that of the longer one is given, so that both sides of the roof may have the same inclination, or that a plummet suspended from the ridge may bisect the angle of concourse; it now remains for us to inquire, if the walls were of the proper dimensions for resisting the thrust of the roof, on the supposition that the rafters are free, and totally unrestrained by ties of any kind.

For this purpose, let ABC and AHC, fig. 3, be the two positions or pitches that we have

*Fig. 3*




shewn the roof susceptible of assuming, and let G and G′ be the positions of the centres of gravity of the sides of the roof respectively; through the centres just named let the vertical lines G*m* and G′*n* be drawn, and they will represent the directions in which each side of the roof acts, considering the whole weight of each side to be concentrated in these points. Now it is very obvious, from the principles of mechanics, that the weight of each side acting in the directions G*m* and G′*n*, will produce the same effect upon the walls as if the whole weight of the roof were applied at the point B, and acting in the direction of gravity BR. Let BR denote the whole weight of the roof, and upon BR, as a diagonal, construct the parallelogram BCR*h*; then is BR resolved into its composant forces BC and B*h*, acting in the directions of the rafters BC and B*h*; but BC is equal to B*h*, as can easily be shewn by the principles of geometry and the nature of the figure; hence it follows, that the thrust on the walls is precisely the same in the direction of each rafter; it is, however, the horizontal thrust that enters into the consideration of the case in question, and to obtain the magnitude of that thrust, we must resolve the oblique force B*h* or BC, which is equal to it, into the co-ordinate or composant forces B*r* and *hr*, the one perpendicular, and the other parallel to the horizon. Now B*r*, the force which acts in the direction of gravity, has no effect whatever in thrusting out the wall from its vertical position; it is only *rh*, or that which acts in a direction parallel to the horizon that becomes effective, and we straightway proceed to determine its magnitude.

According to the data of the question, the length of the building is 34 feet, and the length of the longer rafter is 13 feet, and by a calculation deduced from the principles of construction, we have found the length of the shorter rafter BC, to be 13 − 4·4 = 8·6 feet; but it is moreover stated, that the weight of the tiles and the timber give an average weight of fifteen pounds upon a square foot of surface. Now the whole surface for the upper pitch ABC, is (13 + 8·6) × 34 = 21·6 × 34 = 734·6 square feet, and this being multiplied by fifteen

* It may be proper to remark, that the several coefficients in this equation, as well as the absolute number 6084, are found by introducing the dimensions of the building as specified in the question.

pounds, gives $734{\cdot}6 \times 15 = 11016$ lbs. or 5 tons very nearly.

By trigonometry, the angle $hBr$ is equal to 47° 1′, and consequently, $Bhr$ is 42° 59′; but $Br$ is equal to $rR$, because the triangle $BhR$ is isosceles, and $hr$ is perpendicular to BR; therefore $Br$ is equal to half the whole weight acting in the direction of BR, or 2½ tons; hence we have $hr = 2\frac{1}{2} \times$ cot. 42° 59′; but the natural cotangent of 42° 59′, is 1·0729, and $1{\cdot}0729 \times 2\frac{1}{2} = 2{\cdot}6822$ tons, for the effective thrust of the roof upon the wall in the direction of the horizon. This force, however, acts with the leverage AF = 12 feet, and this gives a momentum or mechanical effect of $2{\cdot}6822 \times 12 = 32{\cdot}1864$ tons.

Now the wall is 1½ feet thick, 12 feet high, and 34 feet long; the solidity is, therefore, equal to $34 \times 12 \times 1\frac{1}{2} = 510$ cubic feet, and a cubic foot of brickwork is about 95 lbs.; but $510 \times 95 = 48450$ lbs., or 21·63 tons the whole weight of the wall, and this resists the thrust of the roof with a leverage of 7½ inches, or 0·625 of a foot; the momentum of resistance is, therefore, equal to $21{\cdot}63 \times 0{\cdot}625 = 13{\cdot}51875$ tons; but we have shewn above, that the momentum of the roof is 32·1864 tons, consequently, the momentum of thrust exceeds the momentum of resistance by 18·668 tons nearly, thereby indicating that very substantial ties were necessary to give the building sufficient stability. But even ties placed where they are said to exist, would have a very powerful effect in diminishing the force of strain over that of the resistance, and, consequently, the calculation made out on the supposition that there are no ties, places the subject in rather an unfavourable light, and quite at variance with the actual state of the case; but our object being more with a view of shewing the mode of calculation in inquiries of this nature, than to shew the efficiency or deficiency of the building in question, we consider the subject as being worthy of some attention. We are not sure that practical men will agree with us in the mode of examination that we have chosen; but we insist upon it, that a calculation should in every instance be resorted to; and to insure complete safety, such calculation should always have reference to the most unfavourable state of the question.

A similar process may be applied to the lower pitch represented by AHC; but we prefer omitting it, as a repetition of the process may become tedious to the general reader, who may, or may not, perform the operations according as he feels inclined. T.

## TUNNEL UNDER LONDON,

### FOR THE LONDON AND BIRMINGHAM RAILWAY.

The proposal made by the London and Birmingham Railway Company, under the direction of their engineer, Mr. Robert Stephenson, to reach their intended central station in Farringdon-street (the site of the late Fleet Prison) by means of a tunnel under London, has excited great attention.

The works of this undertaking, according to the *Railway Telegraph*, are proposed to commence at the Camden Town station of the Birmingham Railway, crossing the Hampstead-road by means of two arches of 70 feet span and 16 feet in height, the junction with the London and Birmingham requiring no alteration of level. From the Hampstead-road the line is proposed to pass (by means of a viaduct varying from 18 to 21 feet in height, and at an inclination of 1 in 97) over Grange-street, Leybourne-road, to the Kentish-town road, and from thence over the Camden-road, Brecknock-place, Great College-street, and the Camden-road villas, at an inclination of 1 in 134, and at a height varying between 20 and 16½ feet. After passing the King's-road the viaduct is to be succeeded by an embankment at an inclination of 1 in 60, and then by a cutting to the western side of Maiden-lane, and to the north of Randall's tile-kilns. At this point the proposed tunnel commences, being at a distance of 1 mile 165 feet from the Camden station, at a depth of 37 and a width of 30 feet. The tunnel takes its course under Carlton-gardens and William-street, Caledonian-road, at a depth varying from 38 to 45 feet, and thence under the Caledonian-road at a depth of 54 feet. From this point the tunnel is proposed to proceed, at a gradually increasing depth, under the tunnel of the Regent's-canal, near Half Moon-crescent, where the depth is 90 feet.

The direction of the tunnel is then under Penton-street, Chapel-street, and White Lion-street, Pentonville, the depth being no less than 101 feet, and the inclination being 1 in 1062. From hence the tunnel passes under the New-road, at Claremont-terrace, in the rear of St. Mark's Church, Myddelton-square, at a depth of 87 feet, gradually decreasing until the tunnel arrives at the New River Head, under which it is proposed to be carried at a depth of 68 feet. A gradual decrease in depth then takes place; under Myddelton-street, Clerkenwell, it is 51 feet; Gloucester-street, 48 feet; Skinner-street, Clerkenwell, 43 feet; Corporation-row, Sekforde-street, and Suffolk-street, each at a depth of 42 feet; Aylesbury-street (leading to the Sessions House), 41 feet; and St. John's-square, 38 feet. From this point the tunnel passes under the closely-populated districts of St. Sepulchre Without, at depths gradually decreasing until it reaches Cowcross, where it will be only 25 feet below the surface. Here it is proposed to carry the tunnel, at a depth varying from 28 to 33 feet, from Greenhill's-rents to West Smithfield, at an inclination of 1 in 1,062. Passing under Greyhound Inn-yard at a depth of 31 feet, the tunnel is proposed to reach Hosier-lane at 28 feet, Cock-lane at 29 feet, and the Saracen's Head Inn-yard at a similar depth. Under Skinner-street, Snow-hill, the depth will be 28 feet, and the tunnel will terminate at Angel-court, on the southern side of Skinner-street, at a depth of 24 feet. A small cutting will here commence, passing through Green Arbour-court, at a depth of 19 feet; Bishop's-court, 14 feet; Seacoal-lane, 11 feet; Fleet-lane, 5 feet; and thence into the city terminus, Fleet Prison yard, where the line will emerge on a level.

The entire length of the intended extension will be 3 miles 4½ chains, of which the tunnel will occupy two miles. It is a singular fact that the tunnel will pass under only one main sewer.

## ACCIDENTS TO BUILDINGS.

Last week, during a storm of wind, say the daily papers, part of the steeple of the church, lately erected at Red-hill, near Reigate, under the superintendence of Mr. Knowles, architect, fell with violence into the body of the church, penetrating the roof, ceiling, and timbers. "The seats are very much damaged, some of them shivered into splinters, and others actually torn from the flooring—such was the force of the concussion." Circumstantial as this account appears, the architect says it is wholly untrue. One stone from the upper part of a pinnacle was all that fell, and the damage was trifling. / The same week in Bristol, at some new buildings which had been in progress of construction, to increase the accommodation for transfer of goods, a vast pile of scaffolding came with a loud crash to the ground. Five of the workmen were more or less injured, and one or two very dangerously so. In the vicinity of Ewer-street, Gravel-lane, Southwark, much alarm was caused by a stack of chimneys falling on the roof of a small cottage occupied by a family of poor Irish persons, one of whom was seriously injured by a large portion of brickwork, which fell upon the head of the eldest child, causing a fracture of the skull, and lacerating the scalp to a considerable extent. A portion of a house situated in White's-place, Newington-causeway, was blown down, but fortunately no one was injured.

## DANGER OF IMPROPERLY FIXING STOVES.

The residence of the Duke of Cambridge was nearly burnt last week, in consequence of improperly setting a stove of low construction in the duke's bedroom. The grate was set on a hearth-stone, with fire bricks and Welsh lumps, but sufficient care had not been taken to secure the timber beneath. On the grate and hearth-stone being removed, it was found that the latter had been placed directly over a beam about a foot square, which, owing to the great heat occasioned by the fires kept to warm the room, had ignited, and set fire to the girders and other portions of the flooring.

## ADVICE TO ARCHITECTS.

### BIRKENHEAD.

I observe in your publication of Saturday, that a hospital is to be competed for at Birkenhead, and as your journal is to be found on the desk of almost every architect, I would beg most respectfully to recommend that the competitors submit that a competent tribunal be formed for deciding upon the best plan,—a tribunal composed of gentlemen of known integrity and taste.

I have had an excellent opportunity for these several years, of judging of the general character of the Birkenhead proprietors, four to six of whom entirely rule the commissioners of the township, are themselves in the commission of the peace, very extensive land speculators, and four of whom keep each an architect almost constantly engaged. Indeed five of them are building each a church, to form a sort of nucleus in their neighbourhood, and they are all well disposed towards any and every scheme that is likely to be the means of giving a "local habitation and a name" to their projects. Besides, it is not improbable that a *ci-devant* architect now elevated to a land-seller, may be on the committee, who (if the gentlemen alluded to do not support their respective protéges), may probably cause the whole of the designs to be thrown aside, and propose to make a more suitable plan than any of them, after the variety of information he will have acquired.

An able article, or report, of the Institute of the Fine Arts on public competitions appeared in a former number, which might be usefully read by every architect as well as every *honest* committee for a true mode of rewarding sterling merit.

But in the present case, competitors ought respectively to demand a published list of the judges of this matter, otherwise they may find the result unsatisfactory.

I remain, Sir, &c.

Liverpool. Veritas.

*** Knowing what we do of some of the leading men in Birkenhead,—men who have effected extraordinary things, and are remarkable for ability and energy,—we have no reason to expect that the competition will be worse managed than, unfortunately, these things usually are. We insert our correspondent's letter (which represents two or three received by us), to shew the committee that parties are looking on, and to induce them to set a good example in this respect as they have in some others. We shall ourselves feel bound to watch the proceedings, by the fact, that we have given the address for particulars, &c., to more than a score of applicants. We conjure each member of the committee to deal as he would if all the responsibility rested on himself.

## EFFECTS OF RAILWAY ENTERPRISE.

The mass of railway enterprise, domestic and foreign, is the strong and distinct evidence of a mighty stride in the progress of nations, one of those great eras which mark the world's history. It may be fraught with the ruin of hundreds, it professes to be big with the happiness of millions. It is looked upon as the precursor of great good, because it comprises, as essential ingredients to its accomplishment, whatever is calculated to elevate, improve, and extend the interests of all classes—the circulation of money—the extension of commerce—the employment of the people—the improvement of the facilities of intercourse at home and abroad. It is impossible to say what important results may spring from these facilities—what discoveries may be effected in science—what increased resources may be acquired at home—what new relations may be formed abroad. With countries into which we have scarcely yet penetrated it may be our privilege to enter into the most advantageous alliance; to open out an intercourse that may provide food and employment for millions unborn. It may be ours to bring into the closest intimacy of family relation the inhabitants of new and comparatively unknown regions, to form settlements, raise cities, and extend all the advantages of trade, and the blessings of religion, where the sound of the hammer has not yet rung, the rush of steam never yet been heard, nor the tidings of salvation yet been proclaimed. Holding such sentiments as these, we should

be the last to throw a damp upon any legitimate enterprise, or to cloud with prejudice and doubt the unknown, the unseen future. This generation has witnessed the mighty revolutions effected by steam in a few years. Where is the infidel who would venture to define the limit of improvement, the boundary of science? Is not the universe one vast storehouse of knowledge, in which we are one day after another making new and important discoveries. The greatest philosoper, in the midst of his brightest acquirements, can only adopt the sentiment of the immortal Newton, and say that he feels as a child upon the sea-shore throwing pebbles into the mighty ocean of truth that lies extended before him.—*Quarterly Review.*

## RAILWAY JOTTINGS.

THERE are at present 5,997 men employed on the various works connected with the Lancaster and Carlisle line, which will be completed by the 1st of July next. The engineer says:—"Of the 6,000,000 cubic yards of earthwork, nearly 5,000,000 are completed, and the remaining quantity is divided into such numerous portions, that at no one point is there any difficulty with average weather. With regard to the masonry, it is equally forward. Of the ordinary bridges, five-sixths are nearly completed.——From the annual returns of railway statistics, drawn up by Mr. G. Greaves, of Liverpool, we learn that during the past five years 12,936,927 persons (equal to half the population of England) travelled on twenty-two lines of railways, and that the total of 1845 exceeded that of 1844 by nearly half a million of persons.——The *Leeds Mercury* gives the following particulars of the parliamentary costs already incurred in promoting unsuccessful projects in the district of the West Riding Union:

| | |
|---|---|
| 1844.—Leeds and Bradford Short Line ..... | £10,500 |
| Ledger Bridge and Cooper Bridge Line—promoted by the Manchester and Leeds Railway Company..... | 20,000 |
| 1845.—West Riding Junction .... | 65,000 |
| West Yorkshire..... | 45,000 |
| Huddersfield, Halifax, and Bradford ..... | 2,500 |
| | £143,000 |
| 1845-6.—West Riding Union (up to this time) ..... | 20,000 |
| | £163,000 |

——One of the most voluminous parliamentary returns connected with railways has recently made its appearance, in the form of a catalogue of upwards of 540 folio pages, consisting of an alphabetical list of the names of all persons in Great Britain and Ireland who subscribed towards the railways of last session less than 2,000*l.*——Strange as it may appear, it is not the less strange than true, that a cargo of railway iron has lately been sent from France to Newport, Monmouthshire.——Railways have operated in many ways that the keenest foresight little anticipated; it is said that they are now causing a difficulty in obtaining recruits for the army, from the great demand for labour in the country districts, and the high wages given.——The tenders sent in for a temporary station, to be erected on the Eastern Union Line, in a field near Stoke Green meeting-house, were as follows;—

| | |
|---|---|
| Mr. Oglevie ..... | £1,740 |
| — Whight (best Baltic) £1,738, (best red pine) ..... | 1,650 |
| — Hearsum ..... | 1,618 |
| — F. Mason ..... | 1,487 |
| — Pettit..... | 1,400 |
| — Ribbans..... | 1,390 |
| — Baldiston ..... | 1,340 |

The lowest was accepted. The work is to be completed in six weeks.——The total gross receipts of the railways for the United Kingdom, for the year 1845, have been almost 6,650,000*l.*, shewing an increase of 1,100,000*l.*, or 20 per cent., over those of the year 1844; 1,800,000*l.*, or 37 per cent., over those of 1843; and 2,300,000*l.*, or 54 per cent., over those of 1842!——Surveyors, during the past week, have been at work in the neighbourhood of the Rolls' estate, in Chancery-lane, with reference to the proposed terminus in Farringdon-street.——The ordnance department, acting upon the suggestion of the British Association, have commenced a series of geological maps of all the existing railways, on a scale of 6 inches to a mile.——The first turf of the Taff Vale, a branch of the North Devon line, was cut on Pentole-marsh, by Mr. William Thorn, one of the directors, on the 5th inst.——An officer of the Bengal native infantry, at present in this country, has, during the past week, addressed the editor of *The Times*, on the subject of Indian railways, and the tedious and expensive mode of transit now in existence between Calcutta and Delhi. He says: "The most expeditious mode of travelling in India is by "dak," which means post in palanquin, the average rate being about four miles per hour. The distance from Calcutta to Delhi is rather more than 900 miles, and consequently, even by incessant day and night travelling, could not be completed under 10 or 11 days; and that, too, at an expense of certainly not less than 100*l.* But what most probably will startle even you, Sir, accustomed as you must be to the marvellous, and will appear ridiculously incredible—this journey could not possibly be accomplished by one solitary traveller without employing a less number than 2,400 palanquin-bearers!" With such facts before us, we can easily comprehend the intense interest, apart from pecuniary gain, that our Indian brethren take in the all-engrossing subject of railway transit.——On the 19th inst. the section of the Whitehaven Junction, from Workington to Maryport, six miles in extent, was opened for general traffic, thus furnishing a continuous route between Workington and Carlisle.——Considerable alarm has been felt within the last few days for the safety of other parts of the Rouen and Havre line besides that to which we referred last week. The *Courrier Français* states, that several cracks have been perceived in the arch of the tunnel near Harfleur, that all traffic has been stopped, and substantial repairs commenced. It is also said, that some large fissures are visible in the Harfleur viaduct.——On Wednesday last the English shareholders of the Orleans and Vierzon line presented Mr. Mathew Uzielli with a testimonial of their sense of his zeal and ability, in bringing to a successful issue the difficult negotiations he had to conduct in Paris, relative to the concession of this railway. It consists of a massive silver candelabrum and plateau, weighing about 1,000 ounces. Round the pedestal of the candelabrum stand three figures, modelled from the design of Baily, R.A., and representing France and England united by commerce, as emblematical of the union of the two countries in the formation of companies for the construction of French railways.

## GAS.

SIR,—I am glad to see that my letters have drawn some attention to the subject of gas and gas-meters.

With reference to your correspondent J. A. E. I stated in a former letter, that the supplying of gas only by meter would compel the companies to manufacture gas of a higher illuminating power than they do at present, and I am justified in making this assertion from the fact, that wherever gas is so sold, the companies do manufacture good gas as they find it to their interest to do so, to make up for the lessening of their rental, by the introduction of gas into private houses, and which cannot be done to any extent under the present system. The smallness of the illuminating power requires a greater quantity of gas and in consequence a larger flame to give the requisite light, and thus the products of combustion are increased, and all gilt-work, paintings, or decorations are sure to be destroyed thereby, and once open the eyes of the consumers to the fact, that their meter will travel faster with bad or weak gas, and they will compel the companies to supply gas of a proper quality. The specific gravity of gas made from Cannel coal, is ·735 of that from Newcastle or Coking coal, only ·397, and the illuminating power is in the same proportion, and it clearly shews, that where the meter only is used, *the one is only half the cost of the other though the price charged per* 1,000 *cubic feet may be the same.* The meter acts, in fact, as an indicator of the quality of the gas passing through it.

The London gas contains a very small proportion of carbon, and which accounts for its want of specific gravity; and this is solely owing to the excessive baking of the coal, which makes good coke and a large quantity of carburetted hydrogen gas. In London, the coal is allowed to remain in the retorts from six to eight hours, whilst in Liverpool, the time never exceeds four hours; as it is found that after that time all the gas that is made, merely serves to deteriorate its quality to a great extent; and it is to the shortness of the charge, combined with the nature of the coal, that the coke in Liverpool is inferior, and not as stated by "J. A. E.," from its having been exhausted in the retorts—*the reverse is the case.* The London companies state, that the coke pays them for the coal used in carbonizing; *if this is true,* they have no right to use the argument that the high price of gas in London arises from the greater cost of coal. How can that be, when, according to their shewing, the coal costs them nothing. I would suggest, that they should adopt the title of "Light Gas, and Coke Companies," as a mark of distinction from those who are only what they profess, "gas companies."

I would not wish to reduce the fair profits of any company, but I do think that the consumer should not be made to pay for the excessive expenditure, ignorance, and carelessness of the existing companies. The expenses of carrying on the business of gas lighting, is very little less in Liverpool than what it is in London, the difference being in the management, and for which they only ought to suffer. The remedy is simple, and would be effectual. Let the consumers demand to be supplied with gas of a certain illuminating power, and by meter only, and the result will be, as I have before stated, of the greatest advantage to all parties.—I am, Sir, &c., CARBON.

Jan. 24, 1846.

## FORGED TRADE MARKS.

A WELL-KNOWN manufacturer has drawn our attention to the practice of unprincipled makers affixing to inferior goods, the names or marks of other makers who have reputation for articles of a superior quality, and whose marks are considered by purchasers as guarantees for the superiority of all goods bearing such distinctions. The known manufacturer, often after a large outlay of capital and many years of labour, is thus robbed both of his profit and good name, and the purchaser is defrauded by having a bad, and, in many cases, a worthless thing foisted upon him. It is notorious that this fraudulent system prevails extensively in the manufacturing districts; and, unfortunately, there is no law which adequately meets the case, and by which the public as well as the manufacturer is protected.

He suggests that manufacturers generally are entitled to the same protection and remedy, which have been provided by the legislature on behalf of the staple trade of Sheffield. Some years since a practice prevailed in the town of Sheffield of making knives and other articles of cutlery of common cast-iron, and by a chemical process in finishing, they were made so as strictly to resemble the genuine articles formed of forged steel. Large quantities of these spurious things were exported to foreign markets, and the consequence was that, the evil resulting to the honest cutlers being very great, the matter was taken up by the legislature, and an Act of Parliament to remedy the evil received the royal assent in the year 1819. Our correspondent asks that, the principle recognised here, and the easy remedy granted, may be applied in securing both manufacturers and purchasers of other goods from being cheated. A simple, speedy, and inexpensive process, administered with strict justice, would stop the evil, preserve to honest men their just profit and their good name, protect the public from imposition, and establish confidence in the quality of British manufactures abroad.

We fully agree with him in the importance of the matter, and reiterate a hope that this remedy will be attempted.

SUDDEN DEATH OF MR. WINSLAND.—Mr. Nicholas Winsland, of the firm of Winsland and Holland, builders, Duke-street, Bloomsbury, died suddenly at his counting-house, on Wednesday week. The deceased was 56 years of age.

## THE LATE MR. RHODES, ARCHITECT.

DIED, January 27th, at his residence in Margaret-street, Cavendish-square, Henry Rhodes, Esq., architect. The following brief memoir of this gentleman is by one who had the advantage of his friendship for many years. Mr. Rhodes was articled at a very early age to the late Mr. Porden, architect to the Prince of Wales, and was the fellow pupil of Mr. P. F. Robinson, author of numerous professional publications. He was for many years joint architect to the Commissioners of her Majesty's Woods, Forests, &c., from which office he retired in 1839 upon a pension. He executed several public and private buildings which evince considerable ability and taste; amongst the former may be named Egham church, Surrey, and Halton church, Bucks (pointed style). Of the latter, the house of Messrs. Hancock and Rixon, in Cockspur-street, may be cited as a happy specimen, the principal façade of which is a very elegant architectural composition.*

Mr. Rhodes was one of the earliest fellows of the Royal Institute of British Architects, and was elected a member of the first council. He took a warm interest in the formation and progress of the society, and was a liberal contributor to its funds and collections. Mr. Rhodes held the appointment of honorary architect and surveyor to the corporation of the royal literary fund, and was for many years a commissioner of the Court of Sewers for Westminster.

He took great interest in antiquarian researches, and was a member of the Archæological Institute. He possessed a fine collection of paintings, a large number of antiquities, and a most extensive and valuable professional library.

It only remains to add that in private life Mr. Rhodes was esteemed as an honourable and amiable man, and that his loss will be deeply regretted by all who had the pleasure of his acquaintance. M. I. B. A.

## THE SOUTH STAFFORDSHIRE GENERAL HOSPITAL.

THIRTY-ONE plans for this building have been submitted from various parts of the kingdom. The committee selected that marked "M, No. 10," which was announced to have been sent in by Mr. Edward Banks, of Wolverhampton, and awarded to it the premium of 100*l*.

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* This elevation is engraved in "Metropolitan Improvements" by Mr. Elmes, who highly commends the design.

## GENERAL PASLEY AND MESSRS. STEPHENSON AND BIDDER.

THE late fatal accident on the Norfolk Railway has led to several contradictory statements as to its cause, and that, too, among those who are or ought to be the best able to give a correct opinion. The public will not fail to draw an unfavourable, but, at the same time, a somewhat correct inference from this want of unity; they have been taught that the knowledge of a disease is half its cure, and that where this knowledge is wanting, the prescribed remedies savour strongly of ignorance and empiricism. It is very easy to carry this chain of reflections a link further, and apply it to cases such as the one under consideration, when it is clear, that while so much difference of opinion prevails respecting the cause of certain railway accidents, there exists no certain means to prevent them, but the continued probability of their recurrence.

Mr. Bidder, the engineer of the Norfolk line, stated at the coroner's inquest, that, in his opinion, the accident was caused by the sudden shutting off of the steam of the engine, by which means the carriages were no longer drawn by the engine, but the engine was propelled by the carriages, and that this, in combination with other circumstances, had the effect of forcing the engine off the line. General Pasley considers Mr. Bidder's opinion to be quite erroneous, and contrary to the "first principles of mechanics." He attributes the accident to the engine-driver proceeding at an imprudent and excessive speed on a descending gradient. Mr. Robert Stephenson concurs generally with the engineering evidence given by Mr. Bidder, and asserts that General Pasley "has ventured to give opinions on a difficult subject, and one with which neither his education nor his experience can have made him thoroughly acquainted." Who shall decide where doctors disagree?

## LIST OF NEW PATENTS

RELATING TO ARCHITECTURE, ENGINEERING, &c. GRANTED FOR ENGLAND.

*Furnished by Mr. A. Prince, of the Office for Patents of Inventions, Lincoln's-inn Fields, London.*

[SIX MONTHS FOR ENROLMENT.]

Moses Poole, of Serle-street, Middlesex, gent., for improvements in locks. Dec. 4.

Henry Bessemer, of Baxter House, Old Saint Pancras-road, Middlesex, engineer, for certain improvements in atmospheric propulsion, and in apparatus connected therewith, part, or parts of which improvements are applicable to the manufacture of columns, pipes, and tubes, and other parts are applicable to the exhausting and impelling of air and other fluids generally. Dec. 5.

John Robert Johnson, Alfred-place, Blackfriars, chemist, for improvements in the materials employed in constructing and working atmospheric railways. Dec. 6.

Henry Heathcote Russell, of Millbank-street, Westminster, civil engineer, for improvements in constructing suspension-bridges and viaducts. Dec. 6.

Henry Augustus Box, of Great Tichfield-street, St. Marylebone, decorator, for a new method of polishing, dyeing, and colouring marble, stone, and certain other materials used in the construction or decoration of houses and other buildings. Dec. 10.

William Dines, of Oldston, near Dartmouth, Devon, esq., for improvements in making and fixing window glass. Dec. 10.

George Leach Ashworth, of Rochdale, Lancaster, cotton-spinner, and Wilson Crossley, of the same place, manager, for certain improvements in machinery or apparatus for preparing and spinning cotton and other fibrous substances. Dec. 10.

William Mushet and Robert Mushet, iron-founders, of Dalkeith, Scotland, for improvements in moulding iron. Dec. 10.

Moses Poole, of Serle-street, Middlesex, gentleman, for improvements in apparatus to be used for drawing and marking. Dec. 10.

Isaac Hawker Bedford, of Birmingham, for improvements in the manufacture of window and other glass. Dec. 12.

John Robert Johnson, of Nelson-square, chemist, for improvements in gas. Dec. 20.

Philip Smith, of High-street, Lambeth, locksmith, for improvements in locks, latches, and other similar fastenings. Dec. 22.

John Russell, of the city of Edinburgh, accountant, for a manufacture of glass tiles. Dec. 30.

IRELAND.

*Furnished by Rich. Telford, Office of Patents, 5, Harcourt-street, Dublin.*

George Myers, of Laurie-terrace, Westminster-road, Lambeth, London, builder, for improvements in cutting or carving wood, stone, and other materials. Dec. 6.

William Joseph Conrad Marie, Baron de Liebhaber, of Paris, France, in consequence of a communication from a certain foreigner residing abroad, for improvements in blasting rocks and other mineral substances, for mining and other purposes, and an apparatus to be used in such works. Dec. 10.

Edward Patrick Emerson, of the city of Dublin, doctor of medicine, for improvements in the manufacture of paints, pigments, cements, and other plastic compositions, and in the machinery or apparatus to be used in such manufactures, parts of which improvements are also applicable to the manufacture of artificial stone and marble. Dec. 10.

## ARCHITECTURAL AND COLLATERAL FOREIGN WORKS, LATELY PUBLISHED.

GERMAN WORKS.

*Hülsse*, Prof., Encyclopedie.—Cyclopedia, general, of Engines. Leipzig. 2 vols. 8vo. atlas fol. each part 3s. and 5s.

*Mauch*, J. M., Architect and Prof., Stuttgard, vergleichende.—Comparative Exposition of Greek Architectural Orders. Potsdam. Fol.

*Mittheilungen.*—Transactions, recent, historical, and antiquarian. By the Thuringian Association or National Antiquities. Halle. 7 vols. 8vo. each part 3s. 6d.

———, Transactions of the Antiquarian Association of Zuric. Ibid. 3 vols. gr. 4to. each part 2s. 6d.

*Mohl*, M., Ergebnisse.—Results of a Manufactorial Journey through France. Stuttgard. Gr. 8vo. with 148 woodcuts, 7s. 6d.

*Moseley-Scheffler.*—The Mechanical Principles of Engineering and Architecture. Translated, with additions, by — Braunschweig. Gr. 8vo. each part 2s.

*Müller*, C. F., Nydebrücke.—The Nyde-Bridge over the Aar at Bern. Zuric. Fol. 11 plates, 18s.

*Mundt*, Th. Aesthetik.—Æsthetic, or the Idea of the Beautiful, and the Art-work in the light of our age. Berlin. 8vo. 5s.

——— and *Mühlbach.*—Berlin and her Arts, results of industrial exhibition, 1844. Ibid. gr. 8vo. 2s.

*Nagler*, Dr. G. K., Künstler Lexicon.—Cyclopedia of Arts, new general; or Memoirs of the Lives and Works of Painters, Sculptors, Architects, Engravers, &c. Munich. Gr. 8vo. 14th vol. each part 2s. [One of the most sterling works of the kind in existence, and highly appreciated on the Continent.]

*Oekel*, C. G., Alphabete.—Normal Alphabets of all Known Tongues, with appropriate ornaments. Berlin. Plates, 4to. 4s. 6d.

*Organ.*—Organ for the technical Progress of Railways. Wiesbaden. Gr. 8vo. each part 2s.

*Lange*, Architect, Ansichten.—Original views of Historical Cities in Germany. Nos. 106—113. Darmstadt. Gr. 4to. plates, each part 2s.

*Ornamente.*—Ornament Book, small, or collection of most varied ornaments. Lissa. Gr. 4to. each part 1s. 6d.

*Piette*, L., Arbeiter.—The Artisans, and practical means for ameliorating their position. Berlin. 12mo. 1s. 6d.

*Pola*, G., Zeichnen.—Linear Drawing and Construction of the Plane. Augsburg. 4to. 5s.

*Programm.*—Programme of the Polytechnic School of Baden. Karlsruhe. 8vo. 1s. 6d.

*Quandt*, F., Basilika.—The Basilicæ of the Ancients, especially those that were Patterns for Christian Churches. Berlin. Gr. 8vo. 2s.

*Raphael's*, Darstellungen.—Raphael's Amor and Psyche in the Farnesina at Rome, drawn on the spot and edited by F. *Schubert*. Munich. Gr. fol. each part 7s.

*Pauly*, A., Encyclopedie.—Cyclopedia of Classic Antiquarianism. Stuttgard. Gr. 8vo., parts 53—56, each 2s.

*Reden*, Baron F. W., Eisenbahnbuch.—Book of German Railroads. Berlin. 8vo. with map, 5s. 6d.

———, Eisenbahnen.—The Railroads of Europe and America. Vols. I. II. III. The Railroads of Germany. Berlin. Lex. 8vo., each part 2s.

*Riehmann*, A., Verzichnungen.—Ornaments for all branches of Industry. Stuttgard. Fol. each part 3s.

*Rohns*, P., Ideen.—Ideas for Sepulchral Monuments. Gottinguen. Gr. Lex. 8vo. 12 plates, 3s.

*Romberg*, J. A., Rathgeber.—Advice for Erecting or Repairing Buildings. Leipsig. Lex. 8vo. 4s.

*Kwasseg*, J., Ansichten.—Views of the State Railway through Stiria. Gratz. Gr. 8vo. plates.

*Sammlung.*—Collection of Baden Building Acts, with law cases. Carlsruhe. Gr. 8vo. 4s.

*Quaglio*, Sammlung.—Collection of Picturesque Castles and other Historical Monuments of Bavarian Antiquity. Drawn from nature. Munich. Fol., each part 8s.

*Sammlung.*— Collection of executed Dwellings—with Details on Construction, Beauty, &c. Leipsig. Fol. each part 3s. 6d. Second edition.

*Schaubach*, A., Bahn.—The Railway to the German Ocean and the Elbe Canal. Leipzig. 16mo. with a map, 2s. 6d.

*Schultz*, J. A., Treppenbau. — Construction of Staircases. Weimar. 8vo. atlas in fol. 7s.

*Mathei*, C., Architect at Dresden, Handbuch.—Hanbook, Theoretico-Practical of the Building Carpenter. Weimar, 3 vols., 8vo. atlas fol. 1*l.* 1s.

*Schimmer*, C. A., Oestreich.—Austria in her remarkable Cities, Domes, Churches, &c. Darmstadt. Lex. 8vo. plates, each part 2s.

*Schlegel*, C. T., Mill-builder, Mühlenbau. — Complete Manual of Mill-building, with the latest American and Swiss Improvements. Leipzig. 8vo. with plates, each part 2s.

*Schmidt*, Prof., Zukunft. — The Futurity of the Working Classes, and the Associations for their Improvement. Berlin. 8vo. 2s.

*Schömann*, G. F.—Winkelmann and Archæology. Greifswalde. 8vo. 1s.

*Schröder*, J., Musterblätter.—Patterns for Building-Carpenters, with the description of Tools and Instruments. Darmstadt. 4to. plates, Gr. fol. each part 3s.

*Schuck*, A., Saülenordnungen.—The Five Architectural Orders, with the Doctrine of their Construction. Aschaffenburg. 4to. plates, 3s. Third edition.

*Schulte*, A., Messkunst.—The Art of Surveying accessible to every Capacity. Siegen. 8vo. plates, 3s.

*Schumann*, Dr. J., Juvavia—Or, Description of the Celtic, Roman, and other Antiquities of Salzburg. Ibid. 8vo. plates, 3s. 6d.

*Steinhäuser*, W., Verzierungen. — Ornaments for Architecture, Carpenterage, &c. Berlin. 4to. plates, each part 3s. 6d.

*Stuckenberg*, J. Ch., Hydrographie.—Hydrography of the Russian Empire, its Harbours and Havens, Crowned by the Imper. Roy. Academy of Sciences. St. Petersburg. 8vo. plates in 4to. 2 vols. 1*l.* 5s.

*Thorwaldsenok*, Album. — Thorwaldsen's Album, collected and edited by F. *Bofrad*. Copenhagen. Gr. 8vo. each part 2s.

*Thyssen*, J. J., Darstellung.— Regulations of the Aachen Association for Promoting Industrious Habits. Ibid. Gr. 8vo. 2s.

*Zeitung.*—Journal for Cabinet-makers and Turners. Weimar. Gr. 4to. each year 7s.

## Miscellanea.

Builders' Fire Insurance Society.—It has often appeared to us remarkable, that the building classes, so influential a body of men, whether we regard the interests they represent, or the vast property under their control, should have not hitherto been adequately represented by institutions which, founded expressly for their mutual benefit and protection, should bring them forward more prominently before the public and the commercial world. We understand that several architects of high character, and builders of eminence, have upon these public grounds made considerable progress in the formation of an insurance society, which, at the same time that it shall guarantee a profitable return to the shareholders, will reduce the excessive premium on risk, now required by the recently adopted tariff of the offices already established, the oppressiveness of which bears very heavily on premises of large extent, or where there is a steam-engine erected for the purposes of business. We see no reason why the building class should not have such a society, as well as the clerical, medical, and legal bodies, who have similar institutions, expressly founded by them, and which are prosperous to a remarkable degree.

A New Ventilator.—Dr. Aldis, physician to the London and to the Surrey Dispensary, deploring the usually vitiated state of the air in the habitations of the lower classes, has contrived a new ventilator for windows, cheap and simple, which promises to be serviceable. At this time of the year the poor cannot be led to open the windows, and the object is to bring in fresh air without producing perceptible currents. The ventilator in question consists of a small pane of glass in a hollow tin frame, in the outer face of which frame are openings; these communicate with a wide flat tube on either side, attached to the two upright sides of the frame, curved inwards, and perforated with small holes on the under side.

Church at Little Drayton.—A district church to accommodate 600 on the ground floor, in the lancet style of Gothic architecture, consisting of nave, side aisles, deeply recessed chancel, and a tower, is in the course of erection at Little Drayton, Shropshire, from the design and under the superintendence of Messrs. S. P. and J. Smith, architects, Shrewsbury.

Lunatic Asylum for the Middle Classes.—A benevolent institution has lately been set on foot for the reception of the insane belonging to a large class of persons neither wealthy enough to resort to an expensive private asylum, nor so destitute as to require parochial aid. The proposed asylum is to be situate in the immediate neighbourhood of London; to supply from 200 to 400 beds; the site to contain 25 acres; the cost, including contingencies, 30,000*l.*; to be commenced as soon as 10,000*l.* are raised. Terms for patients to be from 25s. to 30s. per head per week. Earl Spencer, Lord Ashley, Samuel Gurney, Esq., and B. Bond Cabbell, Esq., are the patrons and trustees, and Edward Conolly, Esq., is the hon. secretary.

County Surveyors. — Mr. E. Leahy, county surveyor of Cork, recently solicited permission to allow his duties to be performed by deputy, during his absence in London, while attending Parliamentary railway committees. The Lord Lieutenant of Ireland declined to comply with the request, "considering it undesirable that county surveyors should be engaged on railroads in their own counties." His Excellency further gave it as his opinion, "that the interests of the counties cannot be properly guarded, having reference to the injury which their public works may receive from the construction of railways passing over or near them, if the county surveyors are not in their own counties unconnected with the management of the latter."

Spanish Ambassador's Chapel. — This chapel, situate in Spanish-place, Manchester-square, and which is attended by the principal members of the aristocracy and gentry professing the Romish faith, is about to be very considerably enlarged, its present accommodation being much below the numbers who regularly attend it.

## MEETINGS OF SCIENTIFIC BODIES.

*During the ensuing week.*

Monday, Feb. 2.—Chemical (Society of Arts), Adelphi, 8 P.M.

Tuesday, 3. — Civil Engineers, 25, Great George-street, 8 P.M.; Syro-Egyptian, 71, Mortimer-street, Cavendish-square, 8 P.M.

Wednesday, 4.—Geological, Somerset House, 8½ P.M.; British Archæological Association (Western Literary Institution), Leicester-square, 8½ P.M.

Thursday, 5. — Royal, Somerset House, 8½ P.M.; Antiquaries, Somerset House, 8 P.M.

Friday, 6. — Royal Institution, Albemarle-street, 8½ P.M.; Botanical, 20, Bedford-street, Covent-garden, 8 P.M.

Saturday, 7.—Asiatic, 14, Grafton-street, 2 P.M.; Royal Botanic, Regent's-park, 4 P.M.

## NOTICES OF CONTRACTS.

[We are compelled by the interference of the Stamp Office to omit the names of the parties to whom tenders, &c., are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent-garden.]

For the masons' and paviers' works, and supply of stone, for one year, to the parish of St. George, Hanover-square,

For the supply of workmen's tools and hammers for stone-breaking, &c., also of iron lamp-posts and gas-fittings, to the parish of St. George, Hanover-square.

For the execution of works on the Newry and Enniskillen Railway, being a distance of about 5½ miles, including excavations, embankments, bridges, culverts, gates, &c.

For making a number of pontoons, or iron-boats, for the support of the landing-stage, at the Liverpool Docks.

For the construction of about 2,550 lineal yards of collateral brick sewers, and about 2,340 lineal yards of branch drains, in the town of Southampton.

For the repair and newly paving (where required) of the foot-pavements within the town of Southampton.

For the performance of the whole of the masons' and paviers' works in Tothill Fields, from Feb. 11, 1846, to Lady-day, 1847.

For the execution of works on the Erewash Valley Railway, being a length of about 16 miles, for the Midland Railway Company.

For the execution of works on the Lynn and Ely Railway, being a length of about 13 miles.

For the execution of works on the Lynn and Dereham Railway, being a length of about 9 miles.

For the masons' and paviers' work of the west division of Southwark, for three years.

For excavating ground, and the erection of a cast-iron tank and gasometer, for the Ratcliffe Gaslight Company.

For the execution of works on the South Wales Railway, being a length of about 14 miles, comprising tunnels, a large amount of earth-work, &c.

For the execution of works on the Dublin and Belfast Junction Railway, viz., the Navan branch.

For the finishing of twenty fourth-rate houses in London.

For the erection of a house at Ryde, Isle of Wight, for the Royal Victoria Yatch Club.

## APPROACHING SALES OF WOOD, &c.

BY AUCTION.

At the New Inn, Halse, near Taunton: about 100 Maiden Elm trees and 20 Maiden Ash do., all being of long lengths and large girths.

At the Black Boy Inn, Weeley, Essex; the Underwood of 16 years' growth in the Weeley Hall Wood.

At Herringswell, near Mildenhall: a large quantity of valuable Larch and Spruce timber trees, &c.

At Madingly, Cambridge: a fall of capital Oak, Ash, and Elm timber trees, &c.

At the Hassells, Sandy: a large fall of excellent Larch and Scotch spires.

At the Swan Inn, Rickmansworth: 252 capital Oak, Ash, and Elm timber trees, now growing in the neighbourhood.

At Great Barton, near Bury: about 1,000 capital Larch and other Firs, Beech and Oak timber trees, some of 30 years' growth, chiefly long and straight.

At the Half Moon Inn, Taunton: 200 prime Oak and Elm timber trees,

At the Elm Tree Inn, Devizes, Wilts: 387 Elm and 83 Oak timber trees. They are of very large dimensions, and arranged in 48 lots.

## TO CORRESPONDENTS.

"E. S."—*Can our correspondent inform us where the chest was found, and in what church it now is.*

"Beginner."—*An architect's clerk is expected to bring his own instruments.*

"J. C. W." *shall appear.*

"A Subscriber."—*Weale (Holborn) has published a work on measuring, &c.*

"V. B."—*We shall gladly avail ourselves of the drawing kindly sent.*

"Constant Reader."—*Dissenters are not allowed to use bells in their chapels, we believe; but we are not aware that the prohibition extends to the introduction of a bell-turret.*

"Subscriber" (Whitecross-street).—*The width of street required by Buildings Act is measured from front to front of house.*

"Dilapidations.—Charge for occupancy."—*In letter signed "Landlord" (p. 47), in last paragraph, line 4, for "lessee" read "lessor."*

"J. M." (Sewage).—*We will look to the papers sent.*

"C. D."—*It will be correct to let the mouldings run completely round.*

"A Subscriber" (Isle of Wight).—*The letters referred to are not published in a separate form.*

"J. Lean."—*Address the Secretary, at No. 4, St. Martin's-place, Charing Cross.*

"A.B."—*Dr. Arnott's "Elements of Physics" is published by Messrs. Longman and Co., Paternoster-row.*

*Next week.* — "J. H." (Liverpool), "An Architect" (Bradford).

*Received.* — "T. A. H.," "S. F.," "J. W." (Jewin-street).

*** Correspondents are requested to address all communications to the Editor, York-street.

## NOTICE.

Full price and thanks will be given by our publisher for copies of "The Builder," for any week in October.


## ADVERTISEMENTS.

REMOVAL.

THOMAS JOHN CROGGON

Begs to inform the Trade that he has removed to 6, LAWRENCE POUNTNEY-HILL and THREE CRANES WHARF, 69, Upper Thames-street. Orders addressed to either place for ROMAN CEMENT of genuine quality will be executed with promptitude and the strictest regard to quality and economy.

## THE LATE MR. RHODES, ARCHITECT.

Died, January 27th, at his residence in Margaret-street, Cavendish-square, Henry Rhodes, Esq., architect. The following brief memoir of this gentleman is by one who had the advantage of his friendship for many years. Mr. Rhodes was articled at a very early age to the late Mr. Porden, architect to the Prince of Wales, and was the fellow pupil of Mr. P. F. Robinson, author of numerous professional publications. He was for many years joint architect to the Commissioners of her Majesty's Woods, Forests, &c., from which office he retired in 1839 upon a pension. He executed several public and private buildings which evince considerable ability and taste; amongst the former may be named Egham church, Surrey, and Halton church, Bucks (pointed style). Of the latter, the house of Messrs. Hancock and Rixon, in Cockspur-street, may be cited as a happy specimen, the principal façade of which is a very elegant architectural composition.*

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Henry Bessemer, of Baxter House, Old Saint Pancras-road, Middlesex, engineer, for certain improvements in atmospheric propulsion, and in apparatus connected therewith, part, or parts of which improvements are applicable to the manufacture of columns, pipes, and tubes, and other parts are applicable to the exhausting and impelling of air and other fluids generally. Dec. 5.

John Robert Johnson, Alfred-place, Blackfriars, chemist, for improvements in the materials employed in constructing and working atmospheric railways. Dec. 6.

Henry Heathcote Russell, of Millbank-street, Westminster, civil engineer, for improvements in constructing suspension-bridges and viaducts. Dec. 6.

Henry Augustus Box, of Great Tichfield-street, St. Marylebone, decorator, for a new method of polishing, dyeing, and colouring marble, stone, and certain other materials used in the construction or decoration of houses and other buildings. Dec. 10.

William Dines, of Oldston, near Dartmouth, Devon, esq., for improvements in making and fixing window glass. Dec. 10.

George Leach Ashworth, of Rochdale, Lancaster, cotton-spinner, and Wilson Crossley, of the same place, manager, for certain improvements in machinery or apparatus for preparing and spinning cotton and other fibrous substances. Dec. 10.

William Mushet and Robert Mushet, iron-founders, of Dalkeith, Scotland, for improvements in moulding iron. Dec. 10.

Moses Poole, of Serle-street, Middlesex, gentleman, for improvements in apparatus to be used for drawing and marking. Dec. 10.

Isaac Hawker Bedford, of Birmingham, for improvements in the manufacture of window and other glass. Dec. 12.

John Robert Johnson, of Nelson-square, chemist, for improvements in gas. Dec. 20.

Philip Smith, of High-street, Lambeth, locksmith, for improvements in locks, latches, and other similar fastenings. Dec. 22.

John Russell, of the city of Edinburgh, accountant, for a manufacture of glass tiles. Dec. 30.

IRELAND.

*Furnished by Rich. Telford, Office of Patents, 5, Harcourt-street, Dublin.*

George Myers, of Laurie-terrace, Westminster-road, Lambeth, London, builder, for improvements in cutting or carving wood, stone, and other materials. Dec. 6.

William Joseph Conrad Marie, Baron de Liebhaber, of Paris, France, in consequence of a communication from a certain foreigner residing abroad, for improvements in blasting rocks and other mineral substances, for mining and other purposes, and an apparatus to be used in such works. Dec. 10.

Edward Patrick Emerson, of the city of Dublin, doctor of medicine, for improvements in the manufacture of paints, pigments, cements, and other plastic compositions, and in the machinery or apparatus to be used in such manufactures, parts of which improvements are also applicable to the manufacture of artificial stone and marble. Dec. 10.

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## Miscellanea.

Builders' Fire Insurance Society.—It has often appeared to us remarkable, that the building classes, so influential a body of men, whether we regard the interests they represent, or the vast property under their control, should have not hitherto been adequately represented by institutions which, founded expressly for their mutual benefit and protection, should bring them forward more prominently before the public and the commercial world. We understand that several architects of high character, and builders of eminence, have upon these public grounds made considerable progress in the formation of an insurance society, which, at the same time that it shall guarantee a profitable return to the shareholders, will reduce the excessive premium on risk, now required by the recently adopted tariff of the offices already established, the oppressiveness of which bears very heavily on premises of large extent, or where there is a steam-engine erected for the purposes of business. We see no reason why the building class should not have such a society, as well as the clerical, medical, and legal bodies, who have similar institutions, expressly founded by them, and which are prosperous to a remarkable degree.

A New Ventilator.—Dr. Aldis, physician to the London and to the Surrey Dispensary, deploring the usually vitiated state of the air in the habitations of the lower classes, has contrived a new ventilator for windows, cheap and simple, which promises to be serviceable. At this time of the year the poor cannot be led to open the windows, and the object is to bring in fresh air without producing perceptible currents. The ventilator in question consists of a small pane of glass in a hollow tin frame, in the outer face of which frame are openings; these communicate with a wide flat tube on either side, attached to the two upright sides of the frame, curved inwards, and perforated with small holes on the under side.

Church at Little Drayton.—A district church to accommodate 600 on the ground floor, in the lancet style of Gothic architecture, consisting of nave, side aisles, deeply recessed chancel, and a tower, is in the course of erection at Little Drayton, Shropshire, from the design and under the superintendence of Messrs. S. P. and J. Smith, architects, Shrewsbury.

Lunatic Asylum for the Middle Classes.—A benevolent institution has lately been set on foot for the reception of the insane belonging to a large class of persons neither wealthy enough to resort to an expensive private asylum, nor so destitute as to require parochial aid. The proposed asylum is to be situate in the immediate neighbourhood of London; to supply from 200 to 400 beds; the site to contain 25 acres; the cost, including contingencies, 30,000*l.*; to be commenced as soon as 10,000*l.* are raised. Terms for patients to be from 25s. to 30s. per head per week. Earl Spencer, Lord Ashley, Samuel Gurney, Esq., and B. Bond Cabbell, Esq., are the patrons and trustees, and Edward Conolly, Esq., is the hon. secretary.

County Surveyors. — Mr. E. Leahy, county surveyor of Cork, recently solicited permission to allow his duties to be performed by deputy, during his absence in London, while attending Parliamentary railway committees. The Lord Lieutenant of Ireland declined to comply with the request, "considering it undesirable that county surveyors should be engaged on railroads in their own counties." His Excellency further gave it as his opinion, "that the interests of the counties cannot be properly guarded, having reference to the injury which their public works may receive from the construction of railways passing over or near them, if the county surveyors are not in their own counties unconnected with the management of the latter."

Spanish Ambassador's Chapel. — This chapel, situate in Spanish-place, Manchester-square, and which is attended by the principal members of the aristocracy and gentry professing the Romish faith, is about to be very considerably enlarged, its present accommodation being much below the numbers who regularly attend it.

## MEETINGS OF SCIENTIFIC BODIES.

*During the ensuing week.*

Monday, Feb. 2.—Chemical (Society of Arts), Adelphi, 8 p.m.

Tuesday, 3. — Civil Engineers, 25, Great George-street, 8 p.m.; Syro-Egyptian, 71, Mortimer-street, Cavendish-square, 8 p.m.

Wednesday, 4.—Geological, Somerset House, 8½ p.m.; British Archæological Association (Western Literary Institution), Leicester-square, 8½ p.m.

Thursday, 5. — Royal, Somerset House, 8½ p.m.; Antiquaries, Somerset House, 8 p.m.

Friday, 6. — Royal Institution, Albemarle-street, 8½ p.m.; Botanical, 20, Bedford-street, Covent-garden, 8 p.m.

Saturday, 7.—Asiatic, 14, Grafton-street, 2 p.m.; Royal Botanic, Regent's-park, 4 p.m.

## NOTICES OF CONTRACTS.

[We are compelled by the interference of the Stamp Office to omit the names of the parties to whom tenders, &c., are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent-garden.]

For the masons' and paviers' works, and supply of stone, for one year, to the parish of St. George, Hanover-square,

For the supply of workmen's tools and hammers for stone-breaking, &c., also of iron lamp-posts and gas-fittings, to the parish of St. George, Hanover-square.

For the execution of works on the Newry and Enniskillen Railway, being a distance of about 5½ miles, including excavations, embankments, bridges, culverts, gates, &c.

For making a number of pontoons, or iron-boats, for the support of the landing-stage, at the Liverpool Docks.

For the construction of about 2,550 lineal yards of collateral brick sewers, and about 2,340 lineal yards of branch drains, in the town of Southampton.

For the repair and newly paving (where required) of the foot-pavements within the town of Southampton.

For the performance of the whole of the masons' and paviers' works in Tothill Fields, from Feb. 11, 1846, to Lady-day, 1847.

For the execution of works on the Erewash Valley Railway, being a length of about 16 miles, for the Midland Railway Company.

For the execution of works on the Lynn and Ely Railway, being a length of about 13 miles.

For the execution of works on the Lynn and Dereham Railway, being a length of about 9 miles.

For the masons' and paviers' work of the west division of Southwark, for three years.

For excavating ground, and the erection of a cast-iron tank and gasometer, for the Ratcliffe Gaslight Company.

For the execution of works on the South Wales Railway, being a length of about 14 miles, comprising tunnels, a large amount of earth-work, &c.

For the execution of works on the Dublin and Belfast Junction Railway, viz., the Navan branch.

For the finishing of twenty fourth-rate houses in London.

For the erection of a house at Ryde, Isle of Wight, for the Royal Victoria Yatch Club.

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"V.B."—*We shall gladly avail ourselves of the drawing kindly sent.*

"Constant Reader."—*Dissenters are not allowed to use bells in their chapels, we believe; but we are not aware that the prohibition extends to the introduction of a bell-turret.*

"Subscriber" (Whitecross-street).—*The width of street required by Buildings Act is measured from front to front of house.*

"Dilapidations.—Charge for occupancy."—*In letter signed "Landlord" (p. 47), in last paragraph, line 4, for "lessee" read "lessor."*

"J. M." (Sewage).—*We will look to the papers sent.*

"C. D."—*It will be correct to let the mouldings run completely round.*

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*Next week.* — "J. H." (Liverpool), "An Architect" (Bradford).

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*** Correspondents are requested to address all communications to the Editor, York-street.

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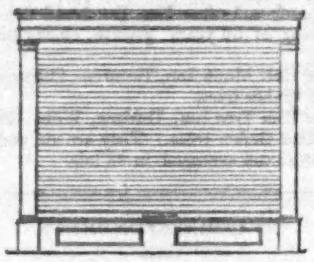

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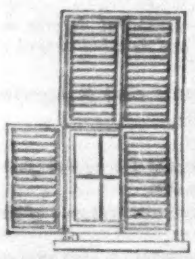

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From THOMAS GRAHAM, Esq., M.A., F.R.S., L. and E., Professor of Chemistry, University College, London.

"After making several experiments on wood prepared by the solution of chloride of zinc for the purpose of preservation, and given the subject my best consideration, I have come to the following conclusions.

"The wood appears to be fully and deeply penetrated by the metallic salt; I have found it in the centre of a large prepared paving block.

"The salt, although very soluble, does not leave the wood easily when exposed to the weather, or buried in dry or damp earth. It does not come to the surface of the wood by efflorescence, like the crystallizable salts. I have no doubt, indeed, that the greater part of the salts will remain in the wood for years, when employed for railway sleepers or such purposes. This may be of material consequence when the wood is exposed to the attacks of insects, such as the white ant in India, which I believe would be repelled by the poisonous metallic salt.

"After being long macerated in cold water, or even boiled in water, thin chips of the prepared wood retain a sensible quantity of the oxide of zinc; which I confirmed by Mr. Toplis's test, and observing that the wood can be permanently dyed from being charged with a metallic mordant.

"I have no doubt, from repeated observations made during several years, of the valuable preservative qualities of the solution of chloride of zinc, as applied in Sir. W. Burnett's process; and would refer its beneficial action chiefly to the small quantity of the metallic salt which is permanently retained by the ligneous fibre in all circumstances of exposure. The oxide of zinc appears to alter and harden the FIBRE of wood, and destroy the solubility, and prevent the tendency to decomposition of the azotised principles it contains, by entering into chemical combination with them.

(Signed) "THOMAS GRAHAM."

"University College, 25th October, 1845.

From Professors BRANDE and COOPER.

"London, 4th November, 1845.

"SIR,—We have this day again examined the specimens of canvas and wood prepared according to the specification of your patent, and which, in the month of April, 1844, we placed in a damp cellar, where they have remained up to this date.

"We are now enabled satisfactorily to corroborate the favourable opinion expressed in our former report. The canvas remains amply protected from all fungous vegetation and rottenness, while a corresponding sample of the same piece, which had not been prepared by immersion in the solution of chloride of zinc, is entirely decayed, being mouldy, rotten, black, and in places resembles timber.

"We have also lately compared the strength of a fibre of a piece of canvas which we prepared according to your specification, in October, 1844, with that of the fibre of the same canvas, unprepared, and find that it has in that respect sustained no injury. We are therefore of opinion that your process will not, after any lapse of time, tend to deteriorate the strength of the fibres of the substances in question.

"In regard to the several samples of different species of wood above adverted to, each of which was cut into two, one half being imbued according to the directions of your specification with the dilute solution of chloride of zinc, while the other half was left in its original condition, we have also to make a favourable report, and to repeat our opinion of the efficacy of your process as a preventive of dry rot, and similar sources of decay; the unprepared specimens are manifesting symptoms of decay and mildew, while those which have been protected by your preparation are clean and sound.—(Signed) "WILLIAM THOMAS BRANDE,
"JOHN THOMAS COOPER."

"To Sir William Burnett, K.C.H., F.R.S., &c. &c."

Testimonials from numerous other parties may be obtained on application, personally or by letter, to the Secretary, and Specimens may be seen at the Office, 53, King William-street, London-bridge.

DRUCE'S No. 2, WHARF, late Paradise-wharf, Chelsea.

TO THE TRADE.—Parties desirous of delivering Timber Deals, Stone, Bricks, or any other goods, in the districts of Chelsea, Brompton, Fulham, Kensington, &c. &c., will find great facilities of Wharfage, Cranage, or Delivery, by applying as above.

N.B.—A weighbridge on the premises.

**PAYNE'S PATENT PROCESS FOR THE PRESERVATION AND IMPROVEMENT OF TIMBER, &c.**

PAYNE and LODER beg to invite the attention of Engineers, Railway Companies, Architects, and others to the above process, and to state that they are prepared to erect the necessary apparatus in any part of the United Kingdom where the quantity is sufficiently large to cover the outlay of its removal.

Further particulars can be obtained at Whitehall-Wharf Cannon-row, Westminster, or at their other stations, Fleetwood-on-Wyre, Lancashire; Wisbeach, Cambridgeshire; Union-Wharf, Southampton; and Guildford, Surrey.

**DUTY OFF ORNAMENTAL WINDOW GLASS.**

CHARLES LONG begs to inform his Friends and the Public, that he can now supply Ornamental Glass from 1s. 3d. per foot superficial; and borders from 9d. per foot, run; and having just built two of the largest Kilns in London, is enabled to execute extensive Orders with unprecedented dispatch, 1, King-street, Portman-square.—Terms, Cash only.

**TO THE PLATE-GLASS TRADE.**

THE BIRMINGHAM PLATE and CROWN-GLASS COMPANY beg to call the attention of the Trade, that their LONDON WAREHOUSE, 141, Fleet-street, is now open for the sale of their Crystal Plate Glass, which for Brilliancy and Colour will be found to stand unrivalled by any other manufactory. All orders, addressed to B. MOSS, London warehouse, or to the works, Smethwick near Birmingham, will be promptly attended to.

W. BROWN'S SOUTH LONDON WINDOW-GLASS and LEAD WAREHOUSE. Lead-pipe, Pump, and Window-lead Manufactory, 6, High-st. (near the Church), Newington Butts, Surrey. Window-glass, and Lead in Sheets, or cut to order; Lead-pipe, Pumps, &c., at the lowest prices. Plumber's manufactured goods, viz., Traps, Service-boxes, Water-closets, &c. Foreign and British Sheet Glass, Crown and Ornamental ditto. Window-lead made to order for Thick Glass. Sashes Glazed, and every article used in the Trades of a Plumber, Painter, and Glazier, on the most advantageous terms.

SASHES primed, glazed, and sent to any part of London at 6d. per foot.

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Coloured and Ornamental Glass, Flatted Crown, and Sheet Plate, for Shop fronts, Shew-cases, &c. The largest stock of Cheap Glass in London for HORTICULTURAL PURPOSES.

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THOS. MILLINGTON begs to inform his friends, that he continues to receive weekly large consignments of FOREIGN GLASS, which he is determined to offer upon the very lowest terms. Address, 87, Bishopsgate-street Without.

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Builders, Coachmakers, Painters, and others may depend on being supplied with a genuine and unadulterated article. Fine Oil Varnish, from 10s. per gallon; best White Spirit Varnish, 21s. ditto; Best Spirit French Polish, 20s. ditto; White Lead, Oil, Turps, and Colours of every description at the very lowest prices.—WALLIS'S Varnish, Japan, and Colour Manufactory, 64, Long-acre, one door from Bow-street. Established 1760.